

#9

SEQUENCE LISTING



<110> Peak, Ian
 Jennings, Michael
 <120> MODIFIED SURFACE ANTIGEN
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 <140> US 09/771,382
 <141> 2001-01-25
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 35 40 45
 Ala Ser Ala Asn Asn Glu Glu Gln Glu Glu Asp Leu Tyr Leu Asp Pro
 50 55 60
 Val Gln Arg Thr Val Ala Val Leu Ile Val Asn Ser Asp Lys Glu Gly
 65 70 75 80
 Thr Gly Glu Lys Glu Lys Val Glu Glu Asn Ser Asp Trp Ala Val Tyr
 85 90 95
 Phe Asn Glu Lys Gly Val Leu Thr Ala Arg Glu Ile Thr Leu Lys Ala
 100 105 110
 Gly Asp Asn Leu Lys Ile Lys Gln Asn Gly Thr Asn Phe Thr Tyr Ser
 115 120 125
 Leu Lys Lys Asp Leu Thr Asp Leu Thr Ser Val Gly Thr Glu Lys Leu
 130 135 140
 Ser Phe Ser Ala Asn Gly Asn Lys Val Asn Ile Thr Ser Asp Thr Lys
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 Gly Leu Asn Phe Ala Lys Glu Thr Ala Gly Thr Asn Gly Asp Thr Thr

165										170					175				
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Thr	Gly	Ala	Thr	Thr	Asn	Val	Thr	Asn	Asp	Asn	Val	Thr	Asp	Asp	Glu				
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Ile	Lys	Gly	Val	Lys	Pro	Gly	Thr	Thr	Ala	Ser	Asp	Asn	Val	Asp	Phe				
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Thr	Thr	Val	Asn	Val	Glu	Ser	Lys	Asp	Asn	Gly	Lys	Lys	Thr	Glu	Val				
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Glu	Gly	Leu	Val	Thr	Ala	Lys	Glu	Val	Ile	Asp	Ala	Val	Asn	Lys	Ala				
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Asp	Glu	Thr	Val	Asn	Ile	Asn	Ala	Gly	Asn	Asn	Ile	Glu	Ile	Thr	Arg				
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Asn	Gly	Lys	Asn	Ile	Asp	Ile	Ala	Thr	Ser	Met	Thr	Pro	Gln	Phe	Ser				
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465 470 475 480
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 485 490 495
 Ala Gln Leu Lys Gly Val Ala Gln Asn Leu Asn Asn Arg Ile Asp Asn
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 Val Asp Gly Asn Ala Arg Ala Gly Ile Ala Gln Ala Ile Ala Thr Ala
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 Gly Leu Val Gln Ala Tyr Leu Pro Gly Lys Ser Met Met Ala Ile Gly
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 Ala Asn Ala Thr Asp Glu Asp Glu Glu Glu Glu Leu Glu Ser Val Gln
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 Arg Ser Val Val Gly Ser Ile Gln Ala Ser Met Glu Gly Ser Val Glu
 65 70 75 80
 Leu Glu Thr Ile Ser Leu Ser Met Thr Asn Asp Ser Lys Glu Phe Val
 85 90 95
 Asp Pro Tyr Ile Val Val Thr Leu Lys Ala Gly Asp Asn Leu Lys Ile
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 Lys Gln Asn Thr Asn Glu Asn Thr Asn Ala Ser Ser Phe Thr Tyr Ser
 115 120 125
 Leu Lys Lys Asp Leu Thr Gly Leu Ile Asn Val Glu Thr Glu Lys Leu
 130 135 140

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A2

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 145 150 155 160
 Gly Leu Asn Phe Ala Lys Glu Thr Ala Gly Thr Asn Gly Asp Thr Thr
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 Val His Leu Asn Gly Ile Gly Ser Thr Leu Thr Asp Met Leu Leu Asn
 180 185 190
 Thr Gly Ala Thr Thr Asn Val Thr Asn Asp Asn Val Thr Asp Asp Glu
 195 200 205
 Lys Lys Arg Ala Ala Ser Val Lys Asp Val Leu Asn Ala Gly Trp Asn
 210 215 220
 Ile Lys Gly Val Lys Pro Gly Thr Thr Ala Ser Asp Asn Val Asp Phe
 225 230 235 240
 Val Arg Thr Tyr Asp Thr Val Glu Phe Leu Ser Ala Asp Thr Lys Thr
 245 250 255
 Thr Thr Val Asn Val Glu Ser Lys Asp Asn Gly Lys Lys Thr Glu Val
 260 265 270
 Lys Ile Gly Ala Lys Thr Ser Val Ile Lys Glu Lys Asp Gly Lys Leu
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 Val Thr Gly Lys Gly Lys Gly Glu Asn Gly Ser Ser Thr Asp Glu Gly
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 Glu Gly Leu Val Thr Ala Lys Glu Val Ile Asp Ala Val Asn Lys Ala
 305 310 315 320
 Gly Trp Arg Met Lys Thr Thr Thr Ala Asn Gly Gln Thr Gly Gln Ala
 325 330 335
 Asp Lys Phe Glu Thr Val Thr Ser Gly Thr Lys Val Thr Phe Ala Ser
 340 345 350
 Gly Asn Gly Thr Thr Ala Thr Val Ser Lys Asp Asp Gln Gly Asn Ile
 355 360 365
 Thr Val Lys Tyr Asp Val Asn Val Gly Asp Ala Leu Asn Val Asn Gln
 370 375 380
 Leu Gln Asn Ser Gly Trp Asn Leu Asp Ser Lys Ala Val Ala Gly Ser
 385 390 395 400
 Ser Gly Lys Val Ile Ser Gly Asn Val Ser Pro Ser Lys Gly Lys Met
 405 410 415
 Asp Glu Thr Val Asn Ile Asn Ala Gly Asn Asn Ile Glu Ile Thr Arg
 420 425 430
 Asn Gly Lys Asn Ile Asp Ile Ala Thr Ser Met Thr Pro Gln Phe Ser
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Ser Val Ser Leu Gly Ala Gly Ala Asp Ala Pro Thr Leu Ser Val Asp
 450 455 460
 Asp Glu Gly Ala Leu Asn Val Gly Ser Lys Asp Ala Asn Lys Pro Val
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 Arg Ile Thr Asn Val Ala Pro Gly Val Lys Glu Gly Asp Val Thr Asn
 485 490 495
 Val Ala Gln Leu Lys Gly Val Ala Gln Asn Leu Asn Asn Arg Ile Asp
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 Asn Val Asn Gly Asn Ala Arg Ala Gly Ile Ala Gln Ala Ile Ala Thr
 515 520 525
 Ala Gly Leu Val Gln Ala Tyr Leu Pro Gly Lys Ser Met Met Ala Ile
 530 535 540
 Gly Gly Gly Thr Tyr Leu Gly Glu Ala Gly Tyr Ala Ile Gly Tyr Ser
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 35 40 45
 Ala Asn Ala Thr Asp Thr Asp Glu Asp Glu Glu Leu Glu Ser Val Ala
 50 55 60
 Arg Ser Ala Leu Val Leu Gln Phe Met Ile Asp Lys Glu Gly Asn Gly
 65 70 75 80
 Glu Ile Glu Ser Thr Gly Asp Ile Gly Trp Ser Ile Tyr Tyr Asp Asp
 85 90 95
 His Asn Thr Leu His Gly Ala Thr Val Thr Leu Lys Ala Gly Asp Asn
 100 105 110
 Leu Lys Ile Lys Gln Ser Gly Lys Asp Phe Thr Tyr Ser Leu Lys Lys
 115 120 125

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Glu Leu Lys Asp Leu Thr Ser Val Glu Thr Glu Lys Leu Ser Phe Gly
 130 135 140
 Ala Asn Gly Asn Lys Val Asn Ile Thr Ser Asp Thr Lys Gly Leu Asn
 145 150 155 160
 Phe Ala Lys Glu Thr Ala Gly Thr Asn Gly Asp Pro Thr Val His Leu
 165 170 175
 Asn Gly Ile Gly Ser Thr Leu Thr Asp Thr Leu Ala Gly Ser Ser Ala
 180 185 190
 Ser His Val Asp Ala Gly Asn Gln Ser Thr His Tyr Thr Arg Ala Ala
 195 200 205
 Ser Ile Lys Asp Val Leu Asn Ala Gly Trp Asn Ile Lys Gly Val Lys
 210 215 220
 Thr Gly Ser Thr Thr Gly Gln Ser Glu Asn Val Asp Phe Val Arg Thr
 225 230 235 240
 Tyr Asp Thr Val Glu Phe Leu Ser Ala Asp Thr Lys Thr Thr Thr Val
 245 250 255
 Asn Val Glu Ser Lys Asp Asn Gly Lys Arg Thr Glu Val Lys Ile Gly
 260 265 270
 Ala Lys Thr Ser Val Ile Lys Glu Lys Asp Gly Lys Leu Val Thr Gly
 275 280 285
 Lys Gly Lys Gly Glu Asn Gly Ser Ser Thr Asp Glu Gly Glu Gly Leu
 290 295 300
 Val Thr Ala Lys Glu Val Ile Asp Ala Val Asn Lys Ala Gly Trp Arg
 305 310 315 320
 Met Lys Thr Thr Thr Ala Asn Gly Gln Thr Gly Gln Ala Asp Lys Phe
 325 330 335
 Glu Thr Val Thr Ser Gly Thr Lys Val Thr Phe Ala Ser Gly Asn Gly
 340 345 350
 Thr Thr Ala Thr Val Ser Lys Asp Asp Gln Gly Asn Ile Thr Val Lys
 355 360 365
 Tyr Asp Val Asn Val Gly Asp Ala Leu Asn Val Asn Gln Leu Gln Asn
 370 375 380
 Ser Gly Trp Asn Leu Asp Ser Lys Ala Val Ala Gly Ser Ser Gly Lys
 385 390 395 400
 Val Ile Ser Gly Asn Val Ser Pro Ser Lys Gly Lys Met Asp Glu Thr
 405 410 415
 Val Asn Ile Asn Ala Gly Asn Asn Ile Glu Ile Thr Arg Asn Gly Lys
 420 425 430

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A2

Asn Ile Asp Ile Ala Thr Ser Met Thr Pro Gln Phe Ser Ser Val Ser
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Leu Gly Ala Gly Ala Asp Ala Pro Thr Leu Ser Val Asp Asp Glu Gly
450 455 460

Ala Leu Asn Val Gly Ser Lys Asp Ala Asn Lys Pro Val Arg Ile Thr
465 470 475 480

Asn Val Ala Pro Gly Val Lys Glu Gly Asp Val Thr Asn Val Ala Gln
485 490 495

Leu Lys Gly Val Ala Gln Asn Leu Asn Asn Arg Ile Asp Asn Val Asn
500 505 510

Gly Asn Ala Arg Ala Gly Ile Ala Gln Ala Ile Ala Thr Ala Gly Leu
515 520 525

Ala Gln Ala Tyr Leu Pro Gly Lys Ser Met Met Ala Ile Gly Gly Gly
530 535 540

Thr Tyr Leu Gly Glu Ala Gly Tyr Ala Ile Gly Tyr Ser Ser Ile Ser
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Asp Thr Gly Asn Trp Val Ile Lys Gly Thr Ala Ser Gly Asn Ser Arg
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Gly His Phe Gly Thr Ser Ala Ser Val Gly Tyr Gln Trp
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Val Ala Val Ser Glu Leu Thr Arg Asn His Thr Lys Arg Ala Ser Ala
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Thr Val Ala Thr Ala Val Leu Ala Thr Leu Leu Phe Ala Thr Val Gln
35 40 45

Ala Ser Thr Thr Asp Asp Asp Asp Leu Tyr Leu Glu Pro Val Gln Arg
50 55 60

Thr Ala Val Val Leu Ser Phe Arg Ser Asp Lys Glu Gly Thr Gly Glu
65 70 75 80

Lys Glu Val Thr Glu Asp Ser Asn Trp Gly Val Tyr Phe Asp Lys Lys
85 90 95

Gly Val Leu Thr Ala Gly Thr Ile Thr Leu Lys Ala Gly Asp Asn Leu

	100		105		110
Lys Ile Lys Gln Asn Thr Asn Glu Asn Thr Asn Ala Ser Ser Phe Thr	115	120	125		
Tyr Ser Leu Lys Lys Asp Leu Thr Asp Leu Thr Ser Val Gly Thr Glu	130	135	140		
Lys Leu Ser Phe Ser Ala Asn Ser Asn Lys Val Asn Ile Thr Ser Asp	145	150	155	160	
Thr Lys Gly Leu Asn Phe Ala Lys Lys Thr Ala Glu Thr Asn Gly Asp	165	170	175		
Thr Thr Val His Leu Asn Gly Ile Gly Ser Thr Leu Thr Asp Thr Leu	180	185	190		
Leu Asn Thr Gly Ala Thr Thr Asn Val Thr Asn Asp Asn Val Thr Asp	195	200	205		
Asp Glu Lys Lys Arg Ala Ala Ser Val Lys Asp Val Leu Asn Ala Gly	210	215	220		
Trp Asn Ile Lys Gly Val Lys Pro Gly Thr Thr Ala Ser Asp Asn Val	225	230	235	240	
Asp Phe Val Arg Thr Tyr Asp Thr Val Glu Phe Leu Ser Ala Asp Thr	245	250	255		
Lys Thr Thr Thr Val Asn Val Glu Ser Lys Asp Asn Gly Lys Arg Thr	260	265	270		
Glu Val Lys Ile Gly Ala Lys Thr Ser Val Ile Lys Glu Lys Asp Gly	275	280	285		
Lys Leu Val Thr Gly Lys Asp Lys Gly Glu Asn Asp Ser Ser Thr Asp	290	295	300		
Lys Gly Glu Gly Leu Val Thr Ala Lys Glu Val Ile Asp Ala Val Asn	305	310	315	320	
Lys Ala Gly Trp Arg Met Lys Thr Thr Thr Ala Asn Gly Gln Thr Gly	325	330	335		
Gln Ala Asp Lys Phe Glu Thr Val Thr Ser Gly Thr Asn Val Thr Phe	340	345	350		
Ala Ser Gly Lys Gly Thr Thr Ala Thr Val Ser Lys Asp Asp Gln Gly	355	360	365		
Asn Ile Thr Val Met Tyr Asp Val Asn Val Gly Asp Ala Leu Asn Val	370	375	380		
Asn Gln Leu Gln Asn Ser Gly Trp Asn Leu Asp Ser Lys Ala Val Ala	385	390	395	400	
Gly Ser Ser Gly Lys Val Ile Ser Gly Asn Val Ser Pro Ser Lys Gly					

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Az

405 410 415
 Lys Met Asp Glu Thr Val Asn Ile Asn Ala Gly Asn Asn Ile Glu Ile
 420 425 430
 Thr Arg Asn Gly Lys Asn Ile Asp Ile Ala Thr Ser Met Thr Pro Gln
 435 440 445
 Phe Ser Ser Val Ser Leu Gly Ala Gly Ala Asp Ala Pro Thr Leu Ser
 450 455 460
 Val Asp Asp Glu Gly Ala Leu Asn Val Gly Ser Lys Asp Ala Asn Lys
 465 470 475 480
 Pro Val Arg Ile Thr Asn Val Ala Pro Gly Val Lys Glu Gly Asp Val
 485 490 495
 Thr Asn Val Ala Gln Leu Lys Gly Val Ala Gln Asn Leu Asn Asn His
 500 505 510
 Ile Asp Asn Val Asp Gly Asn Ala Arg Ala Gly Ile Ala Gln Ala Ile
 515 520 525
 Ala Thr Ala Gly Leu Val Gln Ala Tyr Leu Pro Gly Lys Ser Met Met
 530 535 540
 Ala Ile Gly Gly Gly Thr Tyr Arg Gly Glu Ala Gly Tyr Ala Ile Gly
 545 550 555 560
 Tyr Ser Ser Ile Ser Asp Gly Gly Asn Trp Ile Ile Lys Gly Thr Ala
 565 570 575
 Ser Gly Asn Ser Arg Gly His Phe Gly Ala Ser Ala Ser Val Gly Tyr
 580 585 590
 Gln Trp

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 Thr Val Lys Thr Ala Val Leu Ala Thr Leu Leu Phe Ala Thr Val Gln
 35 40 45
 Ala Ser Ala Asn Asn Glu Glu Gln Glu Asp Leu Tyr Leu Asp Pro
 50 55 60

Val Leu Arg Thr Val Ala Val Leu Ile Val Asn Ser Asp Lys Glu Gly
 65 70 75 80
 Thr Gly Glu Lys Glu Lys Val Glu Glu Asn Ser Asp Trp Ala Val Tyr
 85 90 95
 Phe Asn Glu Lys Gly Val Leu Thr Ala Arg Glu Ile Thr Leu Lys Ala
 100 105 110
 Gly Asp Asn Leu Lys Ile Lys Gln Asn Gly Thr Asn Phe Thr Tyr Ser
 115 120 125
 Leu Lys Lys Asp Leu Thr Asp Leu Thr Ser Val Gly Thr Glu Lys Leu
 130 135 140
 Ser Phe Ser Ala Asn Gly Asn Lys Val Asn Ile Thr Ser Asp Thr Lys
 145 150 155 160
 Gly Leu Asn Phe Ala Lys Glu Thr Ala Gly Thr Asn Gly Asp Thr Thr
 165 170 175
 Val His Leu Asn Gly Ile Gly Ser Thr Leu Thr Asp Thr Leu Leu Asn
 180 185 190
 Thr Gly Ala Thr Thr Asn Val Thr Asn Asp Asn Val Thr Asp Asp Glu
 195 200 205
 Lys Lys Arg Ala Ala Ser Val Lys Asp Val Leu Asn Ala Gly Trp Asn
 210 215 220
 Ile Lys Gly Val Lys Pro Gly Thr Thr Ala Ser Asp Asn Val Asp Phe
 225 230 235 240
 Val Arg Thr Tyr Asp Thr Val Glu Phe Leu Ser Ala Asp Thr Lys Thr
 245 250 255
 Thr Thr Val Asn Val Glu Ser Lys Asp Asn Gly Lys Lys Thr Glu Val
 260 265 270
 Lys Ile Gly Ala Lys Thr Ser Val Ile Lys Glu Lys Asp Gly Lys Leu
 275 280 285
 Val Thr Gly Lys Asp Lys Gly Glu Asn Gly Ser Ser Thr Asp Glu Gly
 290 295 300
 Glu Gly Leu Val Thr Ala Lys Glu Val Ile Asp Ala Val Asn Lys Ala
 305 310 315 320
 Gly Trp Arg Met Lys Thr Thr Thr Ala Asn Gly Gln Thr Gly Gln Ala
 325 330 335
 Asp Lys Phe Glu Thr Val Thr Ser Gly Thr Asn Val Thr Phe Ala Ser
 340 345 350
 Gly Lys Gly Thr Thr Ala Thr Val Ser Lys Asp Asp Gln Gly Asn Ile
 355 360 365

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A2

Thr Val Met Tyr Asp Val Asn Val Gly Asp Ala Leu Asn Val Asn Gln
370 375 380

Leu Gln Asn Ser Gly Trp Asn Leu Asp Ser Lys Ala Val Ala Gly Ser
385 390 395 400

Ser Gly Lys Val Ile Ser Gly Asn Val Ser Pro Ser Lys Gly Lys Met
405 410 415

Asp Glu Thr Val Asn Ile Asn Ala Gly Asn Asn Ile Glu Ile Thr Arg
420 425 430

Asn Gly Lys Asn Ile Asp Ile Ala Thr Ser Met Thr Pro Gln Phe Ser
435 440 445

Ser Val Ser Leu Gly Ala Gly Ala Asp Ala Pro Thr Leu Ser Val Asp
450 455 460

Gly Asp Ala Leu Asn Val Gly Ser Lys Lys Asp Asn Lys Pro Val Arg
465 470 475 480

Ile Thr Asn Val Ala Pro Gly Val Lys Glu Gly Asp Val Thr Asn Val
485 490 495

Ala Gln Leu Lys Gly Val Ala Gln Asn Leu Asn Asn Arg Ile Asp Asn
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Val Asp Gly Asn Ala Arg Ala Gly Ile Ala Gln Ala Ile Ala Thr Ala
515 520 525

Gly Leu Val Gln Ala Tyr Leu Pro Gly Lys Ser Met Met Ala Ile Gly
530 535 540

Gly Gly Thr Tyr Arg Gly Glu Ala Gly Tyr Ala Ile Gly Tyr Ser Ser
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Ile Ser Asp Gly Gly Asn Trp Ile Ile Lys Gly Thr Ala Ser Gly Asn
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Ser Arg Gly His Phe Gly Ala Ser Ala Ser Val Gly Tyr Gln Trp
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<213> Neisseria meningitidis

<400> 6

Met Asn Lys Ile Tyr Arg Ile Ile Trp Asn Ser Ala Leu Asn Ala Trp
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Val Ala Val Ser Glu Leu Thr Arg Asn His Thr Lys Arg Ala Ser Ala
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35 40 45

Ala Asn Ala Thr Asp Glu Asp Glu Glu Glu Glu Leu Glu Pro Val Val
 50 55 60
 Arg Ser Ala Leu Val Leu Gln Phe Met Ile Asp Lys Glu Gly Asn Gly
 65 70 75 80
 Glu Asn Glu Ser Thr Gly Asn Ile Gly Trp Ser Ile Tyr Tyr Asp Asn
 85 90 95
 His Asn Thr Leu His Gly Ala Thr Val Thr Leu Lys Ala Gly Asp Asn
 100 105 110
 Leu Lys Ile Lys Gln Asn Thr Asn Lys Asn Thr Asn Glu Asn Thr Asn
 115 120 125
 Asp Ser Ser Phe Thr Tyr Ser Leu Lys Lys Asp Leu Thr Asp Leu Thr
 130 135 140
 Ser Val Glu Thr Glu Lys Leu Ser Phe Gly Ala Asn Gly Asn Lys Val
 145 150 155 160
 Asn Ile Thr Ser Asp Thr Lys Gly Leu Asn Phe Ala Lys Glu Thr Ala
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 Gly Thr Asn Gly Asp Thr Thr Val His Leu Asn Gly Ile Gly Ser Thr
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 195 200 205
 Asp Asn Val Thr Asp Asp Lys Lys Lys Arg Ala Ala Ser Val Lys Asp
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 Val Leu Asn Ala Gly Trp Asn Ile Lys Gly Val Lys Pro Gly Thr Thr
 225 230 235 240
 Ala Ser Asp Asn Val Asp Phe Val His Thr Tyr Asp Thr Val Glu Phe
 245 250 255
 Leu Ser Ala Asp Thr Lys Thr Thr Thr Val Asn Val Glu Ser Lys Asp
 260 265 270
 Asn Gly Lys Arg Thr Glu Val Lys Ile Gly Ala Lys Thr Ser Val Ile
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 Lys Glu Lys Asp Gly Lys Leu Val Thr Gly Lys Gly Lys Gly Glu Asn
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Thr Asn Val Thr Phe Ala Ser Gly Lys Gly Thr Thr Ala Thr Val Ser
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Lys Asp Asp Gln Gly Asn Ile Thr Val Lys Tyr Asp Val Asn Val Gly
370 375 380

Asp Ala Leu Asn Val Asn Gln Leu Gln Asn Ser Gly Trp Asn Leu Asp
385 390 395 400

Ser Lys Ala Val Ala Gly Ser Ser Gly Lys Val Ile Ser Gly Asn Val
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Ser Pro Ser Lys Gly Lys Met Asp Glu Thr Val Asn Ile Asn Ala Gly
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Asn Asn Ile Glu Ile Thr Arg Asn Gly Lys Asn Ile Asp Ile Ala Thr
435 440 445

Ser Met Thr Pro Gln Phe Ser Ser Val Ser Leu Gly Ala Gly Ala Asp
450 455 460

Ala Pro Thr Leu Ser Val Asp Asp Lys Gly Ala Leu Asn Val Gly Ser
465 470 475 480

Lys Asp Ala Asn Lys Pro Val Arg Ile Thr Asn Val Ala Pro Gly Val
485 490 495

Lys Glu Gly Asp Val Thr Asn Val Ala Gln Leu Lys Gly Val Ala Gln
500 505 510

Asn Leu Asn Asn Arg Ile Asp Asn Val Asp Gly Asn Ala Arg Ala Gly
515 520 525

Ile Ala Gln Ala Ile Ala Thr Ala Gly Leu Val Gln Ala Tyr Leu Pro
530 535 540

Gly Lys Ser Met Met Ala Ile Gly Gly Gly Thr Tyr Arg Gly Glu Ala
545 550 555 560

Gly Tyr Ala Ile Gly Tyr Ser Ser Ile Ser Asp Gly Gly Asn Trp Ile
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580 585 590

Ala Ser Val Gly Tyr Gln Trp
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<213> Neisseria meningitidis

<400> 7

Met Asn Lys Ile Tyr Arg Ile Ile Trp Asn Ser Ala Leu Asn Ala Trp

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Thr Val Ala	Thr Ala Val Leu Ala Thr Leu Leu Phe	Ala Thr Val Gln	
	35	40	45
Ala Asn Ala	Thr Asp Asp Asp Asp Leu Tyr Leu Glu	Pro Val Gln Arg	
	50	55	60
Thr Ala Val	Val Leu Ser Phe Arg Ser Asp Lys Glu Gly Thr Gly Glu		
	65	70	75 80
Lys Glu Gly	Thr Glu Asp Ser Asn Trp Ala Val Tyr Phe Asp Glu Lys		
	85	90	95
Arg Val Leu	Lys Ala Gly Ala Ile Thr Leu Lys Ala Gly Asp Asn Leu		
	100	105	110
Lys Ile Lys	Gln Asn Thr Asn Glu Asn Thr Asn Glu Asn Thr Asn Asp		
	115	120	125
Ser Ser Phe	Thr Tyr Ser Leu Lys Lys Asp Leu Thr Asp Leu Thr Ser		
	130	135	140
Val Glu Thr	Glu Lys Leu Ser Phe Gly Ala Asn Gly Asn Lys Val Asn		
	145	150	155 160
Ile Thr Ser	Asp Thr Lys Gly Leu Asn Phe Ala Lys Glu Thr Ala Gly		
	165	170	175
Thr Asn Gly	Asp Pro Thr Val His Leu Asn Gly Ile Gly Ser Thr Leu		
	180	185	190
Thr Asp Thr	Leu Leu Asn Thr Gly Ala Thr Thr Asn Val Thr Asn Asp		
	195	200	205
Asn Val Thr	Asp Asp Glu Lys Lys Arg Ala Ala Ser Val Lys Asp Val		
	210	215	220
Leu Asn Ala	Gly Trp Asn Ile Lys Gly Val Lys Pro Gly Thr Thr Ala		
	225	230	235 240
Ser Asp Asn	Val Asp Phe Val Arg Thr Tyr Asp Thr Val Glu Phe Leu		
	245	250	255
Ser Ala Asp	Thr Lys Thr Thr Thr Val Asn Val Glu Ser Lys Asp Asn		
	260	265	270
Gly Lys Lys	Thr Glu Val Lys Ile Gly Ala Lys Thr Ser Val Ile Lys		
	275	280	285
Glu Lys Asp	Gly Lys Leu Val Thr Gly Lys Gly Lys Asp Glu Asn Gly		
	290	295	300
Ser Ser Thr	Asp Glu Gly Glu Gly Leu Val Thr Ala Lys Glu Val Ile		

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A2

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Asp	Ala	Val	Asn	Lys	Ala	Gly	Trp	Arg	Met	Lys	Thr	Thr	Thr	Ala	Asn
			325						330					335	
Gly	Gln	Thr	Gly	Gln	Ala	Asp	Lys	Phe	Glu	Thr	Val	Thr	Ser	Gly	Thr
			340					345					350		
Lys	Val	Thr	Phe	Ala	Ser	Gly	Asn	Gly	Thr	Thr	Ala	Thr	Val	Ser	Lys
		355					360					365			
Asp	Asp	Gln	Gly	Asn	Ile	Thr	Val	Lys	Tyr	Asp	Val	Asn	Val	Gly	Asp
	370					375					380				
Ala	Leu	Asn	Val	Asn	Gln	Leu	Gln	Asn	Ser	Gly	Trp	Asn	Leu	Asp	Ser
385					390					395					400
Lys	Ala	Val	Ala	Gly	Ser	Ser	Gly	Lys	Val	Ile	Ser	Gly	Asn	Val	Ser
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Pro	Ser	Lys	Gly	Lys	Met	Asp	Glu	Thr	Val	Asn	Ile	Asn	Ala	Gly	Asn
			420					425					430		
Asn	Ile	Glu	Ile	Thr	Arg	Asn	Gly	Lys	Asn	Ile	Asp	Ile	Ala	Thr	Ser
		435					440					445			
Met	Thr	Pro	Gln	Phe	Ser	Ser	Val	Ser	Leu	Gly	Ala	Gly	Ala	Asp	Ala
	450					455					460				
Pro	Thr	Leu	Ser	Val	Asp	Asp	Glu	Gly	Ala	Leu	Asn	Val	Gly	Ser	Lys
465					470					475					480
Asp	Ala	Asn	Lys	Pro	Val	Arg	Ile	Thr	Asn	Val	Ala	Pro	Gly	Val	Lys
				485					490					495	
Glu	Gly	Asp	Val	Thr	Asn	Val	Ala	Gln	Leu	Lys	Gly	Val	Ala	Gln	Asn
			500					505					510		
Leu	Asn	Asn	Arg	Ile	Asp	Asn	Val	Asp	Gly	Asn	Ala	Arg	Ala	Gly	Ile
		515					520					525			
Ala	Gln	Ala	Ile	Ala	Thr	Ala	Gly	Leu	Ala	Gln	Ala	Tyr	Leu	Pro	Gly
	530					535					540				
Lys	Ser	Met	Met	Ala	Ile	Gly	Gly	Gly	Thr	Tyr	Arg	Gly	Glu	Ala	Gly
545					550					555					560
Tyr	Ala	Ile	Gly	Tyr	Ser	Ser	Ile	Ser	Asp	Thr	Gly	Asn	Trp	Val	Ile
			565						570					575	
Lys	Gly	Thr	Ala	Ser	Gly	Asn	Ser	Arg	Gly	His	Phe	Gly	Ala	Ser	Ala
			580					585					590		
Ser	Val	Gly	Tyr	Gln	Trp										
		595													

<210> 8

<211> 598
 <212> PRT
 <213> Neisseria meningitidis

<400> 8

Met	Asn	Lys	Ile	Ser	Arg	Ile	Ile	Trp	Asn	Ser	Ala	Leu	Asn	Ala	Trp	1	5	10	15
Val	Val	Val	Ser	Glu	Leu	Thr	Arg	Asn	His	Thr	Lys	Arg	Ala	Ser	Ala	20	25	30	
Thr	Val	Ala	Thr	Ala	Val	Leu	Ala	Thr	Leu	Leu	Phe	Ala	Thr	Val	Gln	35	40	45	
Ala	Asn	Ala	Thr	Asp	Asp	Asp	Asp	Leu	Tyr	Leu	Glu	Pro	Val	Gln	Arg	50	55	60	
Thr	Ala	Val	Val	Leu	Ser	Phe	Arg	Ser	Asp	Lys	Glu	Gly	Thr	Gly	Glu	65	70	75	80
Lys	Glu	Gly	Thr	Glu	Asp	Ser	Asn	Trp	Ala	Val	Tyr	Phe	Asp	Glu	Lys	85	90	95	
Arg	Val	Leu	Lys	Ala	Gly	Ala	Ile	Thr	Leu	Lys	Ala	Gly	Asp	Asn	Leu	100	105	110	
Lys	Ile	Lys	Gln	Asn	Thr	Asn	Glu	Asn	Thr	Asn	Glu	Asn	Thr	Asn	Asp	115	120	125	
Ser	Ser	Phe	Thr	Tyr	Ser	Leu	Lys	Lys	Asp	Leu	Thr	Asp	Leu	Thr	Ser	130	135	140	
Val	Glu	Thr	Glu	Lys	Leu	Ser	Phe	Gly	Ala	Asn	Gly	Asn	Lys	Val	Asn	145	150	155	160
Ile	Thr	Ser	Asp	Thr	Lys	Gly	Leu	Asn	Phe	Ala	Lys	Glu	Thr	Ala	Gly	165	170	175	
Thr	Asn	Gly	Asp	Pro	Thr	Val	His	Leu	Asn	Gly	Ile	Gly	Ser	Thr	Leu	180	185	190	
Thr	Asp	Thr	Leu	Leu	Asn	Thr	Gly	Ala	Thr	Thr	Asn	Val	Thr	Asn	Asp	195	200	205	
Asn	Val	Thr	Asp	Asp	Glu	Lys	Lys	Arg	Ala	Ala	Ser	Val	Lys	Asp	Val	210	215	220	
Leu	Asn	Ala	Gly	Trp	Asn	Ile	Lys	Gly	Val	Lys	Pro	Gly	Thr	Thr	Ala	225	230	235	240
Ser	Asp	Asn	Val	Asp	Phe	Val	Arg	Thr	Tyr	Asp	Thr	Val	Glu	Phe	Leu	245	250	255	
Ser	Ala	Asp	Thr	Lys	Thr	Thr	Thr	Val	Asn	Val	Glu	Ser	Lys	Asp	Asn	260	265	270	

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Az

Gly Lys Arg Thr Glu Val Lys Ile Gly Ala Lys Thr Ser Val Ile Lys
 275 280 285
 Glu Lys Asp Gly Lys Leu Val Thr Gly Lys Gly Lys Gly Glu Asn Gly
 290 295 300
 Ser Ser Thr Asp Glu Gly Glu Gly Leu Val Thr Ala Lys Glu Val Ile
 305 310 315 320
 Asp Ala Val Asn Lys Ala Gly Trp Arg Met Lys Thr Thr Thr Ala Asn
 325 330 335
 Gly Gln Thr Gly Gln Ala Asp Lys Phe Glu Thr Val Thr Ser Gly Thr
 340 345 350
 Lys Val Thr Phe Ala Ser Gly Asn Gly Thr Thr Ala Thr Val Ser Lys
 355 360 365
 Asp Asp Gln Gly Asn Ile Thr Val Lys Tyr Asp Val Asn Val Gly Asp
 370 375 380
 Ala Leu Asn Val Asn Gln Leu Gln Asn Ser Gly Trp Asn Leu Asp Ser
 385 390 395 400
 Lys Ala Val Ala Gly Ser Ser Gly Lys Val Ile Ser Gly Asn Val Ser
 405 410 415
 Pro Ser Lys Gly Lys Met Asp Glu Thr Val Asn Ile Asn Ala Gly Asn
 420 425 430
 Asn Ile Glu Ile Thr Arg Asn Gly Lys Asn Ile Asp Ile Ala Thr Ser
 435 440 445
 Met Thr Pro Gln Phe Ser Ser Val Ser Leu Gly Ala Gly Ala Asp Ala
 450 455 460
 Pro Thr Leu Ser Val Asp Asp Glu Gly Ala Leu Asn Val Gly Ser Lys
 465 470 475 480
 Asp Ala Asn Lys Pro Val Arg Ile Thr Asn Val Ala Pro Gly Val Lys
 485 490 495
 Glu Gly Asp Val Thr Asn Val Ala Gln Leu Lys Gly Val Ala Gln Asn
 500 505 510
 Leu Asn Asn Arg Ile Asp Asn Val Asp Gly Asn Ala Arg Ala Gly Ile
 515 520 525
 Ala Gln Ala Ile Ala Thr Ala Gly Leu Ala Gln Ala Tyr Leu Pro Gly
 530 535 540
 Lys Ser Met Met Ala Ile Gly Gly Gly Thr Tyr Arg Gly Glu Ala Gly
 545 550 555 560
 Tyr Ala Ile Gly Tyr Ser Ser Ile Ser Asp Thr Gly Asn Trp Val Ile
 565 570 575

0977133207301
 A2

Lys Gly Thr Ala Ser Gly Asn Ser Arg Gly His Phe Gly Thr Ser Ala
580 585 590

Ser Val Gly Tyr Gln Trp
595

<210> 9
<211> 594
<212> PRT
<213> Neisseria meningitidis

<400> 9

Met Asn Lys Ile Tyr Arg Ile Ile Trp Asn Ser Ala Leu Asn Ala Trp
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Val Val Val Ser Glu Leu Thr Arg Asn His Thr Lys Arg Ala Ser Ala
20 25 30

Thr Val Ala Thr Ala Val Leu Ala Thr Leu Leu Phe Ala Thr Val Gln
35 40 45

Ala Asn Ala Thr Asp Asp Asp Asp Leu Tyr Leu Glu Pro Val Gln Arg
50 55 60

Thr Ala Val Val Leu Ser Phe Arg Ser Asp Lys Glu Gly Thr Gly Glu
65 70 75 80

Lys Glu Gly Thr Glu Asp Ser Asn Trp Ala Val Tyr Phe Asp Glu Lys
85 90 95

Arg Val Leu Lys Ala Gly Ala Ile Thr Leu Lys Ala Gly Asp Asn Leu
100 105 110

Lys Ile Lys Gln Asn Thr Asn Glu Asn Thr Asn Asp Ser Ser Phe Thr
115 120 125

Tyr Ser Leu Lys Lys Asp Leu Thr Asp Leu Thr Ser Val Glu Thr Glu
130 135 140

Lys Leu Ser Phe Gly Ala Asn Gly Asn Lys Val Asn Ile Thr Ser Asp
145 150 155 160

Thr Lys Gly Leu Asn Phe Ala Lys Glu Thr Ala Gly Thr Asn Gly Asp
165 170 175

Pro Thr Val His Leu Asn Gly Ile Gly Ser Thr Leu Thr Asp Thr Leu
180 185 190

Leu Asn Thr Gly Ala Thr Thr Asn Val Thr Asn Asp Asn Val Thr Asp
195 200 205

Asp Glu Lys Lys Arg Ala Ala Ser Val Lys Asp Val Leu Asn Ala Gly
210 215 220

Trp Asn Ile Lys Gly Val Lys Pro Gly Thr Thr Ala Ser Asp Asn Val
225 230 235 240

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A2

Asp Phe Val Arg Thr Tyr Asp Thr Val Glu Phe Leu Ser Ala Asp Thr
 245 250 255
 Lys Thr Thr Thr Val Asn Val Glu Ser Lys Asp Asn Gly Lys Lys Thr
 260 265 270
 Glu Val Lys Ile Gly Ala Lys Thr Ser Val Ile Lys Glu Lys Asp Gly
 275 280 285
 Lys Leu Val Thr Gly Lys Gly Lys Asp Glu Asn Gly Ser Ser Thr Asp
 290 295 300
 Glu Gly Glu Gly Leu Val Thr Ala Lys Glu Val Ile Asp Ala Val Asn
 305 310 315 320
 Lys Ala Gly Trp Arg Met Lys Thr Thr Thr Ala Asn Gly Gln Thr Gly
 325 330 335
 Gln Ala Asp Lys Phe Glu Thr Val Thr Ser Gly Thr Asn Val Thr Phe
 340 345 350
 Ala Ser Gly Lys Gly Thr Thr Ala Thr Val Ser Lys Asp Asp Gln Gly
 355 360 365
 Asn Ile Thr Val Lys Tyr Asp Val Asn Val Gly Asp Ala Leu Asn Val
 370 375 380
 Asn Gln Leu Gln Asn Ser Gly Trp Asn Leu Asp Ser Lys Ala Val Ala
 385 390 395 400
 Gly Ser Ser Gly Lys Val Ile Ser Gly Asn Val Ser Pro Ser Lys Gly
 405 410 415
 Lys Met Asp Glu Thr Val Asn Ile Asn Ala Gly Asn Asn Ile Glu Ile
 420 425 430
 Thr Arg Asn Gly Lys Asn Ile Asp Ile Ala Thr Ser Met Ala Pro Gln
 435 440 445
 Phe Ser Ser Val Ser Leu Gly Ala Gly Ala Asp Ala Pro Thr Leu Ser
 450 455 460
 Val Asp Asp Glu Gly Ala Leu Asn Val Gly Ser Lys Asp Thr Asn Lys
 465 470 475 480
 Pro Val Arg Ile Thr Asn Val Ala Pro Gly Val Lys Glu Gly Asp Val
 485 490 495
 Thr Asn Val Ala Gln Leu Lys Gly Val Ala Gln Asn Leu Asn Asn Arg
 500 505 510
 Ile Asp Asn Val Asp Gly Asn Ala Arg Ala Gly Ile Ala Gln Ala Ile
 515 520 525
 Ala Thr Ala Gly Leu Val Gln Ala Tyr Leu Pro Gly Lys Ser Met Met
 530 535 540

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A2

Ala Ile Gly Gly Asp Thr Tyr Arg Gly Glu Ala Gly Tyr Ala Ile Gly
545 550 555 560

Tyr Ser Ser Ile Ser Asp Gly Gly Asn Trp Ile Ile Lys Gly Thr Ala
565 570 575

Ser Gly Asn Ser Arg Gly His Phe Gly Ala Ser Ala Ser Val Gly Tyr
580 585 590

Gln Trp

<210> 10

<211> 592

<212> PRT

<213> Neisseria meningitidis

<400> 10

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Val Ala Val Ser Glu Leu Thr Arg Asn His Thr Lys Arg Ala Ser Ala
20 25 30

Thr Val Lys Thr Ala Val Leu Ala Thr Leu Leu Phe Ala Thr Val Gln
35 40 45

Ala Asn Ala Thr Asp Glu Asp Glu Glu Glu Glu Leu Glu Ser Val Gln
50 55 60

Arg Ser Val Val Gly Ser Ile Gln Ala Ser Met Glu Gly Ser Gly Glu
65 70 75 80

Leu Glu Thr Ile Ser Leu Ser Met Thr Asn Asp Ser Lys Glu Phe Val
85 90 95

Asp Pro Tyr Ile Val Val Thr Leu Lys Ala Gly Asp Asn Leu Lys Ile
100 105 110

Lys Gln Asn Thr Asn Glu Asn Thr Asn Ala Ser Ser Phe Thr Tyr Ser
115 120 125

Leu Lys Lys Asp Leu Thr Gly Leu Ile Asn Val Glu Thr Glu Lys Leu
130 135 140

Ser Phe Gly Ala Asn Gly Lys Lys Val Asn Ile Ile Ser Asp Thr Lys
145 150 155 160

Gly Leu Asn Phe Ala Lys Glu Thr Ala Gly Thr Asn Gly Asp Thr Thr
165 170 175

Val His Leu Asn Gly Ile Gly Ser Thr Leu Thr Asp Thr Leu Ala Gly
180 185 190

Ser Ser Ala Ser His Val Asp Ala Gly Asn Gln Ser Thr His Tyr Thr

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Az

195	200	205
Arg Ala Ala Ser Ile Lys Asp Val Leu Asn Ala Gly Trp Asn Ile Lys 210 215 220		
Gly Val Lys Thr Gly Ser Thr Thr Gly Gln Ser Glu Asn Val Asp Phe 225 230 235 240		
Val Arg Thr Tyr Asp Thr Val Glu Phe Leu Ser Ala Asp Thr Lys Thr 245 250 255		
Thr Thr Val Asn Val Glu Ser Lys Asp Asn Gly Lys Arg Thr Glu Val 260 265 270		
Lys Ile Gly Ala Lys Thr Ser Val Ile Lys Glu Lys Asp Gly Lys Leu 275 280 285		
Val Thr Gly Lys Gly Lys Gly Glu Asn Gly Ser Ser Thr Asp Glu Gly 290 295 300		
Glu Gly Leu Val Thr Ala Lys Glu Val Ile Asp Ala Val Asn Lys Ala 305 310 315 320		
Gly Trp Arg Met Lys Thr Thr Thr Ala Asn Gly Gln Thr Gly Gln Ala 325 330 335		
Asp Lys Phe Glu Thr Val Thr Ser Gly Thr Asn Val Thr Phe Ala Ser 340 345 350		
Gly Lys Gly Thr Thr Ala Thr Val Ser Lys Asp Asp Gln Gly Asn Ile 355 360 365		
Thr Val Met Tyr Asp Val Asn Val Gly Asp Ala Leu Asn Val Asn Gln 370 375 380		
Leu Gln Asn Ser Gly Trp Asn Leu Asp Ser Lys Ala Val Ala Gly Ser 385 390 395 400		
Ser Gly Lys Val Ile Ser Gly Asn Val Ser Pro Ser Lys Gly Lys Met 405 410 415		
Asp Glu Thr Val Asn Ile Asn Ala Gly Asn Asn Ile Glu Ile Ser Arg 420 425 430		
Asn Gly Lys Asn Ile Asp Ile Ala Thr Ser Met Ala Pro Gln Phe Ser 435 440 445		
Ser Val Ser Leu Gly Ala Gly Ala Asp Ala Pro Thr Leu Ser Val Asp 450 455 460		
Asp Glu Gly Ala Leu Asn Val Gly Ser Lys Asp Ala Asn Lys Pro Val 465 470 475 480		
Arg Ile Thr Asn Val Ala Pro Gly Val Lys Glu Gly Asp Val Thr Asn 485 490 495		
Val Ala Gln Leu Lys Gly Val Ala Gln Asn Leu Asn Asn Arg Ile Asp		

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A2

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T08F70"28ET7450
K2

500 505 510
Asn Val Asp Gly Asn Ala Arg Ala Gly Ile Ala Gln Ala Ile Ala Thr
515 520 525
Ala Gly Leu Val Gln Ala Tyr Leu Pro Gly Lys Ser Met Met Ala Ile
530 535 540
Gly Gly Gly Thr Tyr Arg Gly Glu Ala Gly Tyr Ala Ile Gly Tyr Ser
545 550 555 560
Ser Ile Ser Asp Gly Gly Asn Trp Ile Ile Lys Gly Thr Ala Ser Gly
565 570 575
Asn Ser Arg Gly His Phe Gly Ala Ser Ala Ser Val Gly Tyr Gln Trp
580 585 590

<210> 11
<211> 604
<212> PRT
<213> Neisseria meningitidis
<220>
<221> misc_feature
<223> "X" is any or absent amino acid at a corresponding position in any
y one of SEQ ID NOS 1-10 or a conservative substitution thereof

<400> 11

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Val Xaa Val Ser Glu Leu Thr Arg Asn His Thr Lys Arg Ala Ser Ala
20 25 30
Thr Val Xaa Thr Ala Val Leu Ala Thr Leu Leu Xaa Ala Thr Val Gln
35 40 45
Ala Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
50 55 60
Val Xaa Arg Xaa Xaa Xaa Val Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
65 70 75 80
Xaa Xaa Glu Xaa Glu Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
85 90 95
Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Thr Leu Lys Ala
100 105 110
Gly Asp Asn Leu Lys Ile Lys Gln Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
115 120 125
Xaa Xaa Xaa Xaa Xaa Xaa Phe Thr Tyr Ser Leu Lys Lys Xaa Leu Xaa
130 135 140

Xaa Leu Xaa Xaa Val Xaa Thr Glu Lys Leu Ser Phe Xaa Ala Asn Xaa
 145 150 155 160
 Xaa Lys Val Asn Ile Xaa Ser Asp Thr Lys Gly Leu Asn Phe Ala Lys
 165 170 175
 Xaa Thr Ala Xaa Thr Asn Gly Asp Xaa Thr Val His Leu Asn Gly Ile
 180 185 190
 Gly Ser Thr Leu Thr Asp Xaa Leu Xaa Xaa Xaa Xaa Ala Xaa Xaa Xaa
 195 200 205
 Xaa Xaa Xaa Xaa Xaa Xaa Thr Xaa Xaa Xaa Xaa Xaa Arg Ala Ala Ser
 210 215 220
 Xaa Lys Asp Val Leu Asn Ala Gly Trp Asn Ile Lys Gly Val Lys Xaa
 225 230 235 240
 Gly Xaa Thr Xaa Xaa Xaa Xaa Xaa Asn Val Asp Phe Val Xaa Thr Tyr
 245 250 255
 Asp Thr Val Glu Phe Leu Ser Ala Asp Thr Lys Thr Thr Thr Val Asn
 260 265 270
 Val Glu Ser Lys Asp Asn Gly Lys Xaa Thr Glu Val Lys Ile Gly Ala
 275 280 285
 Lys Thr Ser Val Ile Lys Glu Lys Asp Gly Lys Leu Val Thr Gly Lys
 290 295 300
 Xaa Lys Xaa Glu Asn Xaa Ser Ser Thr Asp Xaa Gly Glu Gly Leu Val
 305 310 315 320
 Thr Ala Lys Glu Val Ile Asp Ala Val Asn Lys Ala Gly Trp Arg Met
 325 330 335
 Lys Thr Thr Thr Ala Asn Gly Gln Thr Gly Gln Ala Asp Lys Phe Glu
 340 345 350
 Thr Val Thr Ser Gly Thr Xaa Val Thr Phe Ala Ser Gly Xaa Gly Thr
 355 360 365
 Thr Ala Thr Val Ser Lys Asp Asp Gln Gly Asn Ile Thr Val Xaa Tyr
 370 375 380
 Asp Val Asn Val Gly Asp Ala Leu Asn Val Asn Gln Leu Gln Asn Ser
 385 390 395 400
 Gly Trp Asn Leu Asp Ser Lys Ala Val Ala Gly Ser Ser Gly Lys Val
 405 410 415
 Ile Ser Gly Asn Val Ser Pro Ser Lys Gly Lys Met Asp Glu Thr Val
 420 425 430
 Asn Ile Asn Ala Gly Asn Asn Ile Glu Ile Xaa Arg Asn Gly Lys Asn
 435 440 445

AZ 09771382 071301
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Ile Asp Ile Ala Thr Ser Met Xaa Pro Gln Phe Ser Ser Val Ser Leu
450 455 460

Gly Ala Gly Ala Asp Ala Pro Thr Leu Ser Val Asp Xaa Xaa Xaa Ala
465 470 475 480

Leu Asn Val Gly Ser Lys Xaa Xaa Asn Lys Pro Val Arg Ile Thr Asn
485 490 495

Val Ala Pro Gly Val Lys Glu Gly Asp Val Thr Asn Val Ala Gln Leu
500 505 510

Lys Gly Val Ala Gln Asn Leu Asn Asn Xaa Ile Asp Asn Val Xaa Gly
515 520 525

Asn Ala Arg Ala Gly Ile Ala Gln Ala Ile Ala Thr Ala Gly Leu Xaa
530 535 540

Gln Ala Tyr Leu Pro Gly Lys Ser Met Met Ala Ile Gly Gly Xaa Thr
545 550 555 560

Tyr Xaa Gly Glu Ala Gly Tyr Ala Ile Gly Tyr Ser Ser Ile Ser Xaa
565 570 575

Xaa Gly Asn Trp Xaa Ile Lys Gly Thr Ala Ser Gly Asn Ser Arg Gly
580 585 590

His Phe Gly Xaa Ser Ala Ser Val Gly Tyr Gln Trp
595 600

<210> 12
<211> 1776
<212> DNA
<213> Neisseria meningitidis

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actctgttgt ttgcaacggt tcaggcaagt gctaacaatg aagagcaaga agaagattta 180
tatttagacc ccgtacaacg cactgttgcc gtgttgatag tcaattccga taaagaaggc 240
acgggagaaa aagaaaaagt agaagaaaat tcagattggg cagtatattt caacgagaaa 300
ggagtactaa cagccagaga aatcaccctc aaagccggcg acaacctgaa aatcaaacaa 360
aacggcacia acttcaccta ctcgctgaaa aaagacctca cagatctgac cagtgttgga 420
actgaaaaat tatcgtttag cgcaaacggc aataaagtca acatcacaag cgacaccaaa 480
ggcttgaatt ttgcgaaaga aacggctggg acgaacggcg acaccacggt tcatctgaac 540
ggtattggtt cgactttgac cgatacgtg ctgaataccg gagcgaccac aaacgtaacc 600
aacgacaacg ttaccgatga cgagaaaaaa cgtgcgggcaa gcgttaaaga cgtattaaac 660

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gtccgcactt acgacacagt cgagttcttg agcgcagata cgaaaacaac gactgttaat 780
gtggaaagca aagacaacgg caagaaaacc gaagttaaaa tcggtgcgaa gacttctgtt 840
attaaagaaa aagacggtaa gttggttact ggtaaagaca aaggcgagaa tggttcttct 900
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ggttggagaa tgaaaacaac aaccgcta at ggtcaaacag gtcaagctga caagtttgaa 1020
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atttcgcagc gcggaaattg gattatcaaa ggcacggctt ccggcaattc gcgcggccat 1740
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<211> 1779
<212> DNA
<213> Neisseria meningitidis

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aactgttgt ttgcaacggg tcaggcgaat gctaccgatg aagatgaaga agaagagtta 180
gaatccgtac aacgctctgt cgtagggagc attcaagcca gtatggaagg cagcgtcgaa 240
ttggaaacga tatcattatc aatgactaac gacagcaagg aatttgtaga ccatacata 300
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 aacgacaacg ttaccgatga cgagaaaaaa cgtgcggcaa gcgttaaaga cgtattaaac 660
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 aacattaatg ccggcaacaa catcgagatt acccgcaacg gcaaaaatat cgacatcgcc 1320
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 ggcatcgccc aagcgattgc aaccgcaggc ctggttcagg cgtatctgcc cggcaagagt 1620
 atgatggcga tcggcgggcg cacttatctc ggcgaagccg gttatgccat cggctactca 1680
 agcatttccg ccggcggaag ttggattatc aaaggcacgg cttccggcaa ttcgcgcggc 1740
 catttcggtg cttccgcata tgcggttat cagtggtaa 1779

<210> 14
 <211> 1770
 <212> DNA
 <213> Neisseria meningitidis

<400> 14
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acactgctgt ccgcaacggg tcaggcgaat gctaccgata ccgatgaaga tgaagagtta	180
gaatccgtag cacgctctgc tctgggtgtg caattcatga tcgataaaga aggcaatgga	240
gaaatcgaat ctacaggaga tatagggttg agtatatatatt acgacgatca caacactcta	300
cacggcgcaa ccgttaccct caaagccggc gacaacctga aaatcaaaca aagcggcaaa	360
gacttcacct actcgctgaa aaaagagctg aaagacctga ccagtgttga aactgaaaaa	420
ttatcgtttg gcgcaaacgg taataaagtc aacatcacia gcgacaccaa aggcttgaat	480
tttgcgaaag aaacggctgg gacgaacggc gacccacgg ttcactctgaa cggtatcggg	540
tcgactttga ccgatacgct tgcgggttct tctgcttctc acgttgatgc gggtaaccaa	600
agtacacatt acactcgctg agcaagtatt aaggatgtgt tgaatgcggg ttggaatatt	660
aagggtgtta aaactggctc aacaactggg caatcagaaa atgtcgattt cgtccgcact	720
tacgacacag tcgagttctt gagcgcagat acgaaaacaa cgactgttaa tgtggaaagc	780
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A2

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A2

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A2

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 <213> Neisseria meningitidis

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<210> 22
<211> 1815
<212> DNA
<213> Neisseria meningitidis

<220>
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at a corresponding position in any one of SEQ ID NOS:12-2

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gttaaagagg gggatgttac aaacgtcgn caacttaaag gngtggcgca aaacttgaac 1560
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gcaggtnng ntcaggnta tntgcccggc aagagtatga tggcgatcgg cggcggnact 1680
tatcncggcg aagccggtta ngccatcggc tactcnagna tttcngncnn nggnaattgg 1740
nttatcaang gcacggcttc cggcaattcg cgcggncatt tcggtncctc cgcattctgtc 1800
ggttatcant ggtaa 1815

<210> 23
<211> 512
<212> PRT
<213> Neisseria meningitidis

<400> 23

Met Asn Lys Ile Tyr Arg Ile Ile Trp Asn Ser Ala Leu Asn Ala Trp
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Val Val Val Ser Glu Leu Thr Arg Asn His Thr Lys Arg Ala Ser Ala
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Thr Val Lys Thr Ala Val Leu Ala Thr Leu Leu Phe Ala Thr Val Gln
35 40 45
Ala Ser Ala Asn Asn Glu Thr Asp Leu Thr Ser Val Gly Thr Glu Lys
50 55 60
Leu Ser Phe Ser Ala Asn Gly Asn Lys Val Asn Ile Thr Ser Asp Thr
65 70 75 80
Lys Gly Leu Asn Phe Ala Lys Glu Thr Ala Gly Thr Asn Gly Asp Thr

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A2

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Glu	Lys	Lys	Arg	Ala	Ala	Ser	Val	Lys	Asp	Val	Leu	Asn	Ala	Gly	Trp				
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Asn	Ile	Lys	Gly	Val	Lys	Pro	Gly	Thr	Thr	Ala	Ser	Asp	Asn	Val	Asp				
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Phe	Val	Arg	Thr	Tyr	Asp	Thr	Val	Glu	Phe	Leu	Ser	Ala	Asp	Thr	Lys				
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Thr	Thr	Thr	Val	Asn	Val	Glu	Ser	Lys	Asp	Asn	Gly	Lys	Lys	Thr	Glu				
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Val	Lys	Ile	Gly	Ala	Lys	Thr	Ser	Val	Ile	Lys	Glu	Lys	Asp	Gly	Lys				
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Leu	Val	Thr	Gly	Lys	Asp	Lys	Gly	Glu	Asn	Gly	Ser	Ser	Thr	Asp	Glu				
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Gly	Glu	Gly	Leu	Val	Thr	Ala	Lys	Glu	Val	Ile	Asp	Ala	Val	Asn	Lys				
225					230					235					240				
Ala	Gly	Trp	Arg	Met	Lys	Thr	Thr	Thr	Ala	Asn	Gly	Gln	Thr	Gly	Gln				
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Ala	Asp	Lys	Phe	Glu	Thr	Val	Thr	Ser	Gly	Thr	Asn	Val	Thr	Phe	Ala				
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Ser	Gly	Lys	Gly	Thr	Thr	Ala	Thr	Val	Ser	Lys	Asp	Asp	Gln	Gly	Asn				
		275					280					285							
Ile	Thr	Val	Met	Tyr	Asp	Val	Asn	Val	Gly	Asp	Ala	Leu	Asn	Val	Asn				
	290					295				300									
Gln	Leu	Gln	Asn	Ser	Gly	Trp	Asn	Leu	Asp	Ser	Lys	Ala	Val	Ala	Gly				
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Ser	Ser	Gly	Lys	Val	Ile	Ser	Gly	Asn	Val	Ser	Pro	Ser	Lys	Gly	Lys				
			325					330						335					
Met	Asp	Glu	Thr	Val	Asn	Ile	Asn	Ala	Gly	Asn	Asn	Ile	Glu	Ile	Thr				
			340					345					350						
Arg	Asn	Gly	Lys	Asn	Ile	Asp	Ile	Ala	Thr	Ser	Met	Thr	Pro	Gln	Phe				
		355					360					365							
Ser	Ser	Val	Ser	Leu	Gly	Ala	Gly	Ala	Asp	Ala	Pro	Thr	Leu	Ser	Val				
	370					375					380								
Asp	Gly	Asp	Ala	Leu	Asn	Val	Gly	Ser	Lys	Lys	Asp	Asn	Lys	Pro	Val				

385 390 395 400
 Arg Ile Thr Asn Val Ala Pro Gly Val Lys Glu Gly Asp Val Thr Asn
 405 410 415
 Val Ala Gln Leu Lys Gly Val Ala Gln Asn Leu Asn Asn Arg Ile Asp
 420 425 430
 Asn Val Asp Gly Asn Ala Arg Ala Gly Ile Ala Gln Ala Ile Ala Thr
 435 440 445
 Ala Gly Leu Val Gln Ala Tyr Leu Pro Gly Lys Ser Met Met Ala Ile
 450 455 460
 Gly Gly Gly Thr Tyr Arg Gly Glu Ala Gly Tyr Ala Ile Gly Tyr Ser
 465 470 475 480
 Ser Ile Ser Asp Gly Gly Asn Trp Ile Ile Lys Gly Thr Ala Ser Gly
 485 490 495
 Asn Ser Arg Gly His Phe Gly Ala Ser Ala Ser Val Gly Tyr Gln Trp
 500 505 510
 <210> 24
 <211> 513
 <212> PRT
 <213> Neisseria meningitidis
 <400> 24
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 20 25 30
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 35 40 45
 Ala Asn Ala Thr Asp Glu Thr Gly Leu Ile Asn Val Glu Thr Glu Lys
 50 55 60
 Leu Ser Phe Gly Ala Asn Gly Lys Lys Val Asn Ile Ile Ser Asp Thr
 65 70 75 80
 Lys Gly Leu Asn Phe Ala Lys Glu Thr Ala Gly Thr Asn Gly Asp Thr
 85 90 95
 Thr Val His Leu Asn Gly Ile Gly Ser Thr Leu Thr Asp Met Leu Leu
 100 105 110
 Asn Thr Gly Ala Thr Thr Asn Val Thr Asn Asp Asn Val Thr Asp Asp
 115 120 125
 Glu Lys Lys Arg Ala Ala Ser Val Lys Asp Val Leu Asn Ala Gly Trp
 130 135 140

Az
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 T00F70"288T760

Asn Ile Lys Gly Val Lys Pro Gly Thr Thr Ala Ser Asp Asn Val Asp
 145 150 155 160
 Phe Val Arg Thr Tyr Asp Thr Val Glu Phe Leu Ser Ala Asp Thr Lys
 165 170 175
 Thr Thr Thr Val Asn Val Glu Ser Lys Asp Asn Gly Lys Lys Thr Glu
 180 185 190
 Val Lys Ile Gly Ala Lys Thr Ser Val Ile Lys Glu Lys Asp Gly Lys
 195 200 205
 Leu Val Thr Gly Lys Gly Lys Gly Glu Asn Gly Ser Ser Thr Asp Glu
 210 215 220
 Gly Glu Gly Leu Val Thr Ala Lys Glu Val Ile Asp Ala Val Asn Lys
 225 230 235 240
 Ala Gly Trp Arg Met Lys Thr Thr Thr Ala Asn Gly Gln Thr Gly Gln
 245 250 255
 Ala Asp Lys Phe Glu Thr Val Thr Ser Gly Thr Lys Val Thr Phe Ala
 260 265 270
 Ser Gly Asn Gly Thr Thr Ala Thr Val Ser Lys Asp Asp Gln Gly Asn
 275 280 285
 Ile Thr Val Lys Tyr Asp Val Asn Val Gly Asp Ala Leu Asn Val Asn
 290 295 300
 Gln Leu Gln Asn Ser Gly Trp Asn Leu Asp Ser Lys Ala Val Ala Gly
 305 310 315 320
 Ser Ser Gly Lys Val Ile Ser Gly Asn Val Ser Pro Ser Lys Gly Lys
 325 330 335
 Met Asp Glu Thr Val Asn Ile Asn Ala Gly Asn Asn Ile Glu Ile Thr
 340 345 350
 Arg Asn Gly Lys Asn Ile Asp Ile Ala Thr Ser Met Thr Pro Gln Phe
 355 360 365
 Ser Ser Val Ser Leu Gly Ala Gly Ala Asp Ala Pro Thr Leu Ser Val
 370 375 380
 Asp Asp Glu Gly Ala Leu Asn Val Gly Ser Lys Asp Ala Asn Lys Pro
 385 390 395 400
 Val Arg Ile Thr Asn Val Ala Pro Gly Val Lys Glu Gly Asp Val Thr
 405 410 415
 Asn Val Ala Gln Leu Lys Gly Val Ala Gln Asn Leu Asn Asn Arg Ile
 420 425 430
 Asp Asn Val Asn Gly Asn Ala Arg Ala Gly Ile Ala Gln Ala Ile Ala
 435 440 445

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A2

Thr Ala Gly Leu Val Gln Ala Tyr Leu Pro Gly Lys Ser Met Met Ala
450 455 460

Ile Gly Gly Gly Thr Tyr Leu Gly Glu Ala Gly Tyr Ala Ile Gly Tyr
465 470 475 480

Ser Ser Ile Ser Ala Gly Gly Asn Trp Ile Ile Lys Gly Thr Ala Ser
485 490 495

Gly Asn Ser Arg Gly His Phe Gly Ala Ser Ala Ser Val Gly Tyr Gln
500 505 510

Trp

<210> 25

<211> 407

<212> PRT

<213> Neisseria meningitidis

<400> 25

Met Asn Lys Ile Tyr Arg Ile Ile Trp Asn Ser Ala Leu Asn Ala Trp
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Val Val Val Ser Glu Leu Thr Arg Asn His Thr Lys Arg Ala Ser Ala
20 25 30

Thr Val Lys Thr Ala Val Leu Ala Thr Leu Leu Phe Ala Thr Val Gln
35 40 45

Ala Ser Ala Asn Asn Val Asp Phe Val Arg Thr Tyr Asp Thr Val Glu
50 55 60

Phe Leu Ser Ala Asp Thr Lys Thr Thr Thr Val Asn Val Glu Ser Lys
65 70 75 80

Asp Asn Gly Lys Lys Thr Glu Val Lys Ile Gly Ala Lys Thr Ser Val
85 90 95

Ile Lys Glu Lys Asp Gly Lys Leu Val Thr Gly Lys Asp Lys Gly Glu
100 105 110

Asn Gly Ser Ser Thr Asp Glu Gly Glu Gly Leu Val Thr Ala Lys Glu
115 120 125

Val Ile Asp Ala Val Asn Lys Ala Gly Trp Arg Met Lys Thr Thr Thr
130 135 140

Ala Asn Gly Gln Thr Gly Gln Ala Asp Lys Phe Glu Thr Val Thr Ser
145 150 155 160

Gly Thr Asn Val Thr Phe Ala Ser Gly Lys Gly Thr Thr Ala Thr Val
165 170 175

Ser Lys Asp Asp Gln Gly Asn Ile Thr Val Met Tyr Asp Val Asn Val
180 185 190

Gly Asp Ala Leu Asn Val Asn Gln Leu Gln Asn Ser Gly Trp Asn Leu
 195 200 205
 Asp Ser Lys Ala Val Ala Gly Ser Ser Gly Lys Val Ile Ser Gly Asn
 210 215 220
 Val Ser Pro Ser Lys Gly Lys Met Asp Glu Thr Val Asn Ile Asn Ala
 225 230 235 240
 Gly Asn Asn Ile Glu Ile Thr Arg Asn Gly Lys Asn Ile Asp Ile Ala
 245 250 255
 Thr Ser Met Thr Pro Gln Phe Ser Ser Val Ser Leu Gly Ala Gly Ala
 260 265 270
 Asp Ala Pro Thr Leu Ser Val Asp Gly Asp Ala Leu Asn Val Gly Ser
 275 280 285
 Lys Lys Asp Asn Lys Pro Val Arg Ile Thr Asn Val Ala Pro Gly Val
 290 295 300
 Lys Glu Gly Asp Val Thr Asn Val Ala Gln Leu Lys Gly Val Ala Gln
 305 310 315 320
 Asn Leu Asn Asn Arg Ile Asp Asn Val Asp Gly Asn Ala Arg Ala Gly
 325 330 335
 Ile Ala Gln Ala Ile Ala Thr Ala Gly Leu Val Gln Ala Tyr Leu Pro
 340 345 350
 Gly Lys Ser Met Met Ala Ile Gly Gly Gly Thr Tyr Arg Gly Glu Ala
 355 360 365
 Gly Tyr Ala Ile Gly Tyr Ser Ser Ile Ser Asp Gly Gly Asn Trp Ile
 370 375 380
 Ile Lys Gly Thr Ala Ser Gly Asn Ser Arg Gly His Phe Gly Ala Ser
 385 390 395 400
 Ala Ser Val Gly Tyr Gln Trp
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<210> 26
 <211> 433
 <212> PRT
 <213> Neisseria meningitidis

<400> 26

Met Asn Lys Ile Tyr Arg Ile Ile Trp Asn Ser Ala Leu Asn Ala Trp
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Val Val Val Ser Glu Leu Thr Arg Asn His Thr Lys Arg Ala Ser Ala
 20 25 30

Thr Val Lys Thr Ala Val Leu Ala Thr Leu Leu Phe Ala Thr Val Gln

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35	40	45
Ala Ser Ala Asn Arg Ala Ala Ser Val Lys Asp Val Leu Asn Ala Gly		
50	55	60
Trp Asn Ile Lys Gly Val Lys Pro Gly Thr Thr Ala Ser Asp Asn Val		
65	70	75
Asp Phe Val Arg Thr Tyr Asp Thr Val Glu Phe Leu Ser Ala Asp Thr		
	85	90
		95
Lys Thr Thr Thr Val Asn Val Glu Ser Lys Asp Asn Gly Lys Lys Thr		
	100	105
		110
Glu Val Lys Ile Gly Ala Lys Thr Ser Val Ile Lys Glu Lys Asp Gly		
	115	120
		125
Lys Leu Val Thr Gly Lys Asp Lys Gly Glu Asn Gly Ser Ser Thr Asp		
	130	135
		140
Glu Gly Glu Gly Leu Val Thr Ala Lys Glu Val Ile Asp Ala Val Asn		
	145	150
		155
Lys Ala Gly Trp Arg Met Lys Thr Thr Thr Ala Asn Gly Gln Thr Gly		
	165	170
		175
Gln Ala Asp Lys Phe Glu Thr Val Thr Ser Gly Thr Asn Val Thr Phe		
	180	185
		190
Ala Ser Gly Lys Gly Thr Thr Ala Thr Val Ser Lys Asp Asp Gln Gly		
	195	200
		205
Asn Ile Thr Val Met Tyr Asp Val Asn Val Gly Asp Ala Leu Asn Val		
	210	215
		220
Asn Gln Leu Gln Asn Ser Gly Trp Asn Leu Asp Ser Lys Ala Val Ala		
	225	230
		235
Gly Ser Ser Gly Lys Val Ile Ser Gly Asn Val Ser Pro Ser Lys Gly		
	245	250
		255
Lys Met Asp Glu Thr Val Asn Ile Asn Ala Gly Asn Asn Ile Glu Ile		
	260	265
		270
Thr Arg Asn Gly Lys Asn Ile Asp Ile Ala Thr Ser Met Thr Pro Gln		
	275	280
		285
Phe Ser Ser Val Ser Leu Gly Ala Gly Ala Asp Ala Pro Thr Leu Ser		
	290	295
		300
Val Asp Gly Asp Ala Leu Asn Val Gly Ser Lys Lys Asp Asn Lys Pro		
	305	310
		315
Val Arg Ile Thr Asn Val Ala Pro Gly Val Lys Glu Gly Asp Val Thr		
	325	330
		335
Asn Val Ala Gln Leu Lys Gly Val Ala Gln Asn Leu Asn Asn Arg Ile		

340	345	350
Asp Asn Val Asp Gly Asn Ala Arg Ala Gly Ile Ala Gln Ala Ile Ala		
355	360	365
Thr Ala Gly Leu Val Gln Ala Tyr Leu Pro Gly Lys Ser Met Met Ala		
370	375	380
Ile Gly Gly Gly Thr Tyr Arg Gly Glu Ala Gly Tyr Ala Ile Gly Tyr		
385	390	395
Ser Ser Ile Ser Asp Gly Gly Asn Trp Ile Ile Lys Gly Thr Ala Ser		
405	410	415
Gly Asn Ser Arg Gly His Phe Gly Ala Ser Ala Ser Val Gly Tyr Gln		
420	425	430

Trp

<210> 27
 <211> 502
 <212> PRT
 <213> Neisseria meningitidis
 <400> 27

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Val Val Val Ser Glu Leu Thr Arg Asn His Thr Lys Arg Ala Ser Ala	
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Thr Val Lys Thr Ala Val Leu Ala Thr Leu Leu Phe Ala Thr Val Gln	
35 40 45	
Ala Ser Ala Asn Thr Leu Lys Ala Gly Asp Asn Leu Lys Ile Lys Gln	
50 55 60	
Phe Thr Tyr Ser Leu Lys Lys Asp Leu Thr Asp Leu Thr Ser Val Gly	
65 70 75 80	
Thr Glu Lys Leu Ser Phe Ser Ala Asn Gly Asn Lys Val Asn Ile Thr	
85 90 95	
Ser Asp Thr Lys Gly Leu Asn Phe Ala Lys Glu Thr Ala Gly Thr Asn	
100 105 110	
Gly Asp Thr Thr Val His Leu Asn Gly Ile Gly Ser Thr Leu Thr Asp	
115 120 125	
Arg Ala Ala Ser Val Lys Asp Val Leu Asn Ala Gly Trp Asn Ile Lys	
130 135 140	
Gly Val Lys Asn Val Asp Phe Val Arg Thr Tyr Asp Thr Val Glu Phe	
145 150 155 160	

Leu Ser Ala Asp Thr Lys Thr Thr Thr Val Asn Val Glu Ser Lys Asp
 165 170 175
 Asn Gly Lys Lys Thr Glu Val Lys Ile Gly Ala Lys Thr Ser Val Ile
 180 185 190
 Lys Glu Lys Asp Gly Lys Leu Val Thr Gly Lys Asp Lys Gly Glu Asn
 195 200 205
 Gly Ser Ser Thr Asp Glu Gly Glu Gly Leu Val Thr Ala Lys Glu Val
 210 215 220
 Ile Asp Ala Val Asn Lys Ala Gly Trp Arg Met Lys Thr Thr Thr Ala
 225 230 235 240
 Asn Gly Gln Thr Gly Gln Ala Asp Lys Phe Glu Thr Val Thr Ser Gly
 245 250 255
 Thr Asn Val Thr Phe Ala Ser Gly Lys Gly Thr Thr Ala Thr Val Ser
 260 265 270
 Lys Asp Asp Gln Gly Asn Ile Thr Val Met Tyr Asp Val Asn Val Gly
 275 280 285
 Asp Ala Leu Asn Val Asn Gln Leu Gln Asn Ser Gly Trp Asn Leu Asp
 290 295 300
 Ser Lys Ala Val Ala Gly Ser Ser Gly Lys Val Ile Ser Gly Asn Val
 305 310 315 320
 Ser Pro Ser Lys Gly Lys Met Asp Glu Thr Val Asn Ile Asn Ala Gly
 325 330 335
 Asn Asn Ile Glu Ile Thr Arg Asn Gly Lys Asn Ile Asp Ile Ala Thr
 340 345 350
 Ser Met Thr Pro Gln Phe Ser Ser Val Ser Leu Gly Ala Gly Ala Asp
 355 360 365
 Ala Pro Thr Leu Ser Val Asp Gly Asp Ala Leu Asn Val Gly Ser Lys
 370 375 380
 Lys Asp Asn Lys Pro Val Arg Ile Thr Asn Val Ala Pro Gly Val Lys
 385 390 395 400
 Glu Gly Asp Val Thr Asn Val Ala Gln Leu Lys Gly Val Ala Gln Asn
 405 410 415
 Leu Asn Asn Arg Ile Asp Asn Val Asp Gly Asn Ala Arg Ala Gly Ile
 420 425 430
 Ala Gln Ala Ile Ala Thr Ala Gly Leu Val Gln Ala Tyr Leu Pro Gly
 435 440 445
 Lys Ser Met Met Ala Ile Gly Gly Gly Thr Tyr Arg Gly Glu Ala Gly
 450 455 460

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Az

Tyr Ala Ile Gly Tyr Ser Ser Ile Ser Asp Gly Gly Asn Trp Ile Ile
465 470 475 480

Lys Gly Thr Ala Ser Gly Asn Ser Arg Gly His Phe Gly Ala Ser Ala
485 490 495

Ser Val Gly Tyr Gln Trp
500

<210> 28
<211> 1539
<212> DNA
<213> Neisseria meningitidis

<400> 28
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actctgttgt ttgcaacggt tcaggcaagt gctaacaatg aaacagatct gaccagtgtt 180
ggaactgaaa aattatcggt tagcgcaaac ggcaataaag tcaacatcac aagcgacacc 240
aaaggcttga attttgcgaa agaaacggct gggacgaacg gcgacaccac gggtcatctg 300
aacggtattg gttcgacttt gaccgatacg ctgctgaata ccggagcgac cacaaacgta 360
accaacgaca acggtaccga tgacgagaaa aaacgtgcgg caagcgttaa agacgtatta 420
aacgctggct ggaacattaa aggcgttaaa cccggtacaa cagcttccga taacgttgat 480
ttcgtccgca cttacgacac agtcgagttc ttgagcgcag atacgaaaac aacgactgtt 540
aatgtggaaa gcaaagacaa cggcaagaaa accgaagtta aaatcgggtgc gaagacttct 600
gttattaaag aaaaagacgg taagttgggt actggtaaag acaaaggcga gaatggttct 660
tctacagacg aaggcgaagg cttagtact gcaaaagaag tgattgatgc agtaaacaag 720
gctggttga gaatgaaaac aacaaccgct aatggtcaaa caggtcaagc tgacaagttt 780
gaaaccgtta catcaggcac aaatgtaacc ttgctagtgc gtaaaggtag aactgcgact 840
gtaagtaaag atgatcaagg caacatcact gttatgtatg atgtaaatgt cggcgatgcc 900
ctaaacgtca atcagctgca aaacagcggg tggaatttgg attccaaagc ggttgcaggt 960
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gccacttga tgaccccgca gttttccagc gtttcgctcg gcgcgggggc ggatgcgccc 1140
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cgcattacca atgtcgcccc gggcggttaaa gagggggatg ttacaaacgt cgcacaactt 1260

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aaaggcgtgg cgcaaaactt gaacaaccgc atcgacaatg tggacggcaa cgcgcggtgcg	1320
ggcatcgccc aagcgattgc aaccgcaggt ctgggttcagg cgtattttgcc cggcaagagt	1380
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 <212> DNA
 <213> Neisseria meningitidis

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aacggtatcg gttcgacttt gaccgatatg ctgctgaata ccggagcgac caaaaacgta	360
accaacgaca acgttaccga tgacgagaaa aaacgtgcgg caagcgtaa agacgtatta	420
aacgcaggct ggaacattaa aggcgttaaa cccggtacaa cagcttccga taacgttgat	480
ttcgtccgca cttacgacac agtcgagttc ttgagcgcag atacgaaaac aacgactgtt	540
aatgtggaaa gcaaagacaa cggcaagaaa accgaagtta aaatcgggtgc gaagacttct	600
gttattaaag aaaaagacgg taagttgggt actggttaaag gcaaaggcga gaatggttct	660
tctacagacg aaggcgaagg cttagtact gcaaaagaag tgattgatgc agtaaacaag	720
gctgggttga gaatgaaaac aacaaccgct aatggtcaaa caggtcaagc tgacaagttt	780
gaaaccgtta catcaggcac aaaagtaacc tttgctagtg gtaatggtac aactgcgact	840
gtaagtaaag atgatcaagg caacatcact gttaagtatg atgtaaatgt cggcgatgcc	900
ctaaacgtca atcagctgca aaacagcggg tgggaatttg attccaaagc ggttgcaggt	960
tcttcgggca aagtcacag cggcaatgtt tcgccgagca agggaaagat ggatgaaacc	1020
gtcaacatta atgccggcaa caacatcgag attaccgcga acggcaaaaa tatcgacatc	1080
gccacttcga tgaccccgca attttccagc gtttcgctcg gcgcgggggc ggatgcgccc	1140
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 agtatgatgg cgatcggcgg cggcacttat ctggcggaag ccggttatgc catcggtac 1440
 tcaagcattt ccgccggcgg aaattggatt atcaaaggca cggcttccgg caattcgcgc 1500
 ggccatttcg gtgcttccgc atctgtcggt tatcagtggg aa 1542

<210> 30
 <211> 1224
 <212> DNA
 <213> Neisseria meningitidis

<400> 30
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 actctgttgt ttgcaacggt tcaggcaagt gctaacaacg ttgatttcgt ccgcacttac 180
 gacacagtcg agttcttgag cgcagatacg aaaacaacga ctgttaatgt ggaaagcaaa 240
 gacaacggca agaaaaaccga agttaaaatc ggtgcgaaga cttctgttat taaagaaaaa 300
 gacggtaagt tggttactgg taaagacaaa ggcgagaatg gttcttctac agacgaaggc 360
 gaaggcttag tgactgcaaa agaagtgatt gatgcagtaa acaaggctgg ttggagaatg 420
 aaaacaacaa ccgctaattg tcaaacagggt caagctgaca agtttgaaac cgttacatca 480
 ggcacaaatg taacctttgc tagtggtaaa ggtacaactg cgactgtaag taaagatgat 540
 caaggcaaca tcaactgttat gtatgatgta aatgtcggcg atgccctaaa cgtcaatcag 600
 ctgcaaaaaca gcggttgaa tttggattcc aaagcgggtg caggttcttc gggcaaagtc 660
 atcagcggca atgtttcgcc gagcaaggga aagatggatg aaaccgtcaa cattaatgcc 720
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 ccgcagtttt ccagcgtttc gctcggcgcg ggggcggatg cggccacttt gagcgtggat 840
 ggggacgcat tgaatgtcgg cagcaagaag gacaacaaac ccgtccgcat taccaatgtc 900
 gccccgggcg ttaaagaggg ggatgttaca aacgtcgcac aacttaaagg cgtggcgcaa 960
 aacttgaaca accgcatcga caatgtggac ggcaacgcgc gtgcgggcat cgccaagcg 1020
 attgcaaccg caggctctgt tcaggcgtat ttgccgggca agagtatgat ggcgatcggc 1080
 ggcggcactt atcgcggcga agccgggttac gccatcgggt actccagtat ttccgacggc 1140

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ggaaattgga ttatcaaagg cacggcttcc ggcaattcgc gcggccattt cggtgcttcc 1200
gcatctgtcg gttatcagtg gtaa 1224

<210> 31
<211> 1302
<212> DNA
<213> Neisseria meningitidis

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atgaacaaaa tataccgcat catttggaat agtgccctca atgcatgggt cgtcgtatcc 60
gagctcacac gcaaccacac caaacgcgcc tccgcaaccg tgaagaccgc cgtattggcg 120
actctgttgt ttgcaacggc tcaggcaagt gctaaccgtg cggcaagcgt taaagacgta 180
ttaaacgctg gctggaacat taaaggcgtt aaaccggta caacagcttc cgataacggt 240
gatttcgtcc gcacttacga cacagtcgag ttcttgagcg cagatacgaa aacaacgact 300
gttaatgtgg aaagcaaaga caacggcaag aaaaccgaag ttaaaatcgg tgcgaagact 360
tctgttatta aagaaaaaga cggtaagttg gttactggta aagacaaagg cgagaatggt 420
tcttctacag acgaaggcga aggcttagtg actgcaaaag aagtgattga tgcagtaaac 480
aaggctggtt ggagaatgaa aacaacaacc gctaattggc aaacagggtca agctgacaag 540
tttgaaaccg ttacatcagg cacaaatgta acctttgcta gtggtaaagg tacaactgcg 600
actgtaagta aagatgatca aggcaacatc actgttatgt atgatgtaaa tgcggcgat 660
gccctaaacg tcaatcagct gcaaaacagc gggttgaatt tggattccaa agcggttgca 720
ggttcttcgg gcaaagtcac cagcggcaat gtttcgccga gcaagggaaa gatggatgaa 780
accgtcaaca ttaatgccgg caacaacatc gagattaccc gcaacggtaa aaatatcgac 840
atcgccactt cgatgacccc gcagttttcc agcgtttcgc tcggcgcggg ggcggatgcg 900
cccactttga gcgtggatgg ggacgcattg aatgtcggca gcaagaagga caacaaaccc 960
gtccgcatta ccaatgtcgc cccgggcggt aaagaggggg atgttacaaa cgtcgcacaa 1020
cttaaaggcg tggcgcaaaa cttgaacaac cgcacgaca atgtggacgg caacgcgcgt 1080
gcgggcatcg cccaagcgat tgcaaccgca ggtctggttc aggcgtatct gcccggaag 1140
agtatgatgg cgatcggcgg cggcacttat cgcggcgaag ccggttacgc catcggctac 1200
tccagtatct ccgacggcgg aaattggatt atcaaaggca cggcttccgg caattcgcgc 1260
ggccatttcg gtgcttcgc atctgtcggg tatcagtggt aa 1302

<210> 32

<211> 1509
 <212> DNA
 <213> Neisseria meningitidis

<400> 32
 atgaacaaaa tataaccgcat catttggaat agtgccctca atgcatgggt cgtcgtatcc 60
 gagctcacac gcaaccacac caaacgcgcc tccgcaaccg tgaagaccgc cgtattggcg 120
 actctgttgt ttgcaacgggt tcaggcaagt gctaacaccc tcaaagccgg cgacaacctg 180
 aaaatcaaac aattcaccta ctcgctgaaa aaagacctca cagatctgac cagtgttgga 240
 actgaaaaat tatcgtttag cgcaaacggc aataaagtca acatcacaag cgacaccaaa 300
 ggcttgaatt ttgcgaaaga aacggctggg acgaacggcg acaccacgggt tcatctgaac 360
 ggtattgggt cgactttgac cgatcgtgcg gcaagcgtta aagacgtatt aaacgctggc 420
 tggaacatta aaggcggtta aaacgttgat ttcgtccgca cttacgacac agtcgagttc 480
 ttgagcgcag atacgaaaac aacgactgtt aatgtggaaa gcaaagacaa cggcaagaaa 540
 accgaagtta aaatcgggtgc gaagacttct gttattaaag aaaaagacgg taagttgggt 600
 actggtaaag acaaaggcga gaatgggtct tctacagacg aaggcgaagg cttagtgact 660
 gcaaaagaag tgattgatgc agtaacaag gctgggttga gaatgaaaac aacaaccgct 720
 aatggtcaaa caggtcaagc tgacaagttt gaaaccgtta catcaggcac aaatgtaacc 780
 tttgctagtg gtaaaggtag aactgcgact gtaagtaaag atgatcaagg caacatcact 840
 gttatgtatg atgtaaattgt cggcgatgcc ctaaacgtca atcagctgca aaacagcgggt 900
 tggaatttgg attccaaagc gggttcaggt tcttcgggca aagtcatcag cggcaatggt 960
 tcgccgagca agggaaagat ggatgaaacc gtcaacatta atgccggcaa caacatcgag 1020
 attaccgcga acggtaaaaa tatcgacatc gccacttoga tgaccccgca gttttccagc 1080
 gtttcgctcg gcgcgggggc ggatgcgccc actttgagcg tggatgggga cgcattgaat 1140
 gtcggcagca agaaggacaa caaaccgctc cgcattacca atgtcgcccc gggcggttaa 1200
 gagggggatg ttacaaacgt cgcacaactt aaaggcgtgg cgaaaactt gaacaaccgc 1260
 atcgacaatg tggacggcaa cgcgcgtgcg ggcacgccc aagcgattgc aaccgcaggt 1320
 ctggttcagg cgtatttgcc cggcaagagt atgatggcga tcggcggcgg cacttatcgc 1380
 ggcaagccg gttacgccat cggctactcc agtatttccg acggcggaaa ttggattatc 1440
 aaaggcacgg cttccggcaa ttcgcgcggc catttcggtg cttccgcac tgcggttat 1500
 cagtggtaa 1509

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<210> 33
 <211> 540
 <212> PRT
 <213> Neisseria meningitidis

<400> 33

Asn Asn Glu Glu Gln Glu Glu Tyr Leu Tyr Leu His Pro Val Gln Arg
 1 5 10 15
 Thr Val Ala Val Leu Ile Val Asn Ser Asp Lys Glu Gly Ala Gly Glu
 20 25 30
 Lys Glu Lys Val Glu Glu Asn Ser Asp Trp Ala Val Tyr Phe Asn Glu
 35 40 45
 Lys Gly Val Leu Thr Ala Arg Glu Ile Thr Leu Lys Ala Gly Asp Asn
 50 55 60
 Leu Lys Ile Lys Gln Asn Gly Thr Asn Phe Thr Tyr Ser Leu Lys Lys
 65 70 75 80
 Asp Leu Thr Asp Leu Thr Ser Val Gly Thr Glu Lys Leu Ser Phe Ser
 85 90 95
 Ala His Gly Asn Lys Val Asn Ile Thr Ser Asp Thr Lys Gly Leu Asn
 100 105 110
 Phe Ala Lys Glu Thr Ala Gly Thr Asn Gly Asp Thr Thr Val His Leu
 115 120 125
 Asn Gly Ile Gly Ser Thr Leu Thr Asp Thr Leu Leu Asn Thr Gly Ala
 130 135 140
 Thr Thr Asn Val Thr Asn Asp Asn Val Thr Asp Asp Glu Lys Lys Arg
 145 150 155 160
 Ala Ala Ser Val Lys Asp Val Leu Asn Ala Gly Trp Asn Ile Lys Gly
 165 170 175
 Val Lys Pro Gly Thr Thr Ala Ser Asp Asn Val Asp Phe Val Arg Thr
 180 185 190
 Tyr Asp Thr Val Glu Phe Leu Ser Ala Asp Thr Lys Thr Thr Thr Val
 195 200 205
 Asn Val Glu Ser Lys Asp Asn Gly Lys Lys Thr Glu Val Lys Ile Gly
 210 215 220
 Ala Lys Thr Ser Val Ile Lys Glu Lys Asp Gly Lys Leu Val Thr Gly
 225 230 235 240
 Lys Asp Lys Gly Glu Asn Gly Ser Ser Thr Asp Glu Gly Glu Gly Leu
 245 250 255
 Val Thr Ala Lys Glu Val Ile Asp Ala Val Asn Lys Ala Gly Trp Arg

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Az

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260 265 270
 Met Lys Thr Thr Thr Ala Asn Gly Gln Thr Gly Gln Ala Asp Lys Phe
 275 280 285
 Glu Thr Val Thr Ser Gly Thr Asn Val Thr Phe Ala Ser Gly Lys Gly
 290 295 300
 Thr Thr Ala Thr Val Ser Lys Asp Asp Gln Gly Asn Ile Thr Val Met
 305 310 315 320
 Tyr Asp Val Asn Val Gly Asp Ala Leu Asn Val Asn Gln Leu Gln Asn
 325 330 335
 Ser Gly Trp Asn Leu Asp Ser Lys Ala Val Ala Gly Ser Ser Gly Lys
 340 345 350
 Val Ile Ser Gly Asn Val Ser Pro Ser Lys Gly Lys Met Asp Glu Thr
 355 360 365
 Val Asn Ile Asn Ala Gly Asn Asn Ile Glu Ile Thr Arg Asn Gly Lys
 370 375 380
 Asn Ile Asp Ile Ala Thr Ser Met Thr Pro Gln Phe Ser Ser Val Ser
 385 390 395 400
 Leu Gly Ala Gly Ala Asp Ala Pro Thr Leu Ser Val Asp Gly Asp Ala
 405 410 415
 Leu Asn Val Gly Ser Lys Lys Asp Asn Lys Pro Val Arg Ile Thr Asn
 420 425 430
 Val Ala Pro Gly Val Lys Glu Gly Asp Val Thr Asn Val Ala Gln Leu
 435 440 445
 Lys Gly Val Ala Gln Asn Leu Asn Asn Arg Ile Asp Asn Val Asp Gly
 450 455 460
 Asn Ala Arg Ala Gly Ile Ala Gln Ala Ile Ala Thr Ala Gly Leu Val
 465 470 475 480
 Gln Ala Tyr Leu Pro Gly Lys Ser Met Met Ala Ile Gly Gly Gly Thr
 485 490 495
 Tyr Arg Gly Glu Ala Gly Tyr Ala Ile Gly Tyr Ser Ser Ile Ser Asp
 500 505 510
 Gly Gly Asn Trp Ile Ile Lys Gly Thr Ala Ser Gly Asn Ser Arg Gly
 515 520 525
 His Phe Gly Ala Ser Ala Ser Val Gly Tyr Gln Trp
 530 535 540

<210> 34
 <211> 541
 <212> PRT
 <213> Neisseria meningitidis

<400> 34

Thr Asp Glu Asp Glu Glu Glu Glu Leu Glu Ser Val Gln Arg Ser Val
1 5 10 15
Val Gly Ser Ile Gln Ala Ser Met Glu Gly Ser Val Glu Leu Glu Thr
20 25 30
Ile Ser Leu Ser Met Thr Asn Asp Ser Lys Glu Phe Val Asp Pro Tyr
35 40 45
Ile Val Val Thr Leu Lys Ala Gly Asp Asn Leu Lys Ile Lys Gln Asn
50 55 60
Thr Asn Glu Asn Thr Asn Ala Ser Ser Phe Thr Tyr Ser Leu Lys Lys
65 70 75 80
Asp Leu Thr Gly Leu Ile Asn Val Glu Thr Glu Lys Leu Ser Phe Gly
85 90 95
Ala Asn Gly Lys Lys Val Asn Ile Ile Ser Asp Thr Lys Gly Leu Asn
100 105 110
Phe Ala Lys Glu Thr Ala Gly Thr Asn Gly Asp Thr Thr Val His Leu
115 120 125
Asn Gly Ile Gly Ser Thr Leu Thr Asp Met Leu Leu Asn Thr Gly Ala
130 135 140
Thr Thr Asn Val Thr Asn Asp Asn Val Thr Asp Asp Glu Lys Lys Arg
145 150 155 160
Ala Ala Ser Val Lys Asp Val Leu Asn Ala Gly Trp Asn Ile Lys Gly
165 170 175
Val Lys Pro Gly Thr Thr Ala Ser Asp Asn Val Asp Phe Val Arg Thr
180 185 190
Tyr Asp Thr Val Glu Phe Leu Ser Ala Asp Thr Lys Thr Thr Thr Val
195 200 205
Asn Val Glu Ser Lys Asp Asn Gly Lys Lys Thr Glu Val Lys Ile Gly
210 215 220
Ala Lys Thr Ser Val Ile Lys Glu Lys Asp Gly Lys Leu Val Thr Gly
225 230 235 240
Lys Gly Lys Gly Glu Asn Gly Ser Ser Thr Asp Glu Gly Glu Gly Leu
245 250 255
Val Thr Ala Lys Glu Val Ile Asp Ala Val Asn Lys Ala Gly Trp Arg
260 265 270
Met Lys Thr Thr Thr Ala Asn Gly Gln Thr Gly Gln Ala Asp Lys Phe
275 280 285

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Glu Thr Val Thr Ser Gly Thr Lys Val Thr Phe Ala Ser Gly Asn Gly
 290 295 300
 Thr Thr Ala Thr Val Ser Lys Asp Asp Gln Gly Asn Ile Thr Val Lys
 305 310 315 320
 Tyr Asp Val Asn Val Gly Asp Ala Leu Asn Val Asn Gln Leu Gln Asn
 325 330 335
 Ser Gly Trp Asn Leu Asp Ser Lys Ala Val Ala Gly Ser Ser Gly Lys
 340 345 350
 Val Ile Ser Gly Asn Val Ser Pro Ser Lys Gly Lys Met Asp Glu Thr
 355 360 365
 Val Asn Ile Asn Ala Gly Asn Asn Ile Glu Ile Thr Arg Asn Gly Lys
 370 375 380
 Asn Ile Asp Ile Ala Thr Ser Met Thr Pro Gln Phe Ser Ser Val Ser
 385 390 395 400
 Leu Gly Ala Gly Ala Asp Ala Pro Thr Leu Ser Val Asp Asp Glu Gly
 405 410 415
 Ala Leu Asn Val Gly Ser Lys Asp Ala Asn Lys Pro Val Arg Ile Thr
 420 425 430
 Asn Val Ala Pro Gly Val Lys Glu Gly Asp Val Thr Asn Val Ala Gln
 435 440 445
 Leu Lys Gly Val Ala Gln Asn Leu Asn Asn Arg Ile Asp Asn Val Asn
 450 455 460
 Gly Asn Ala Arg Ala Gly Ile Ala Gln Ala Ile Ala Thr Ala Gly Leu
 465 470 475 480
 Val Gln Ala Tyr Leu Pro Gly Lys Ser Met Met Ala Ile Gly Gly Gly
 485 490 495
 Thr Tyr Leu Gly Glu Ala Gly Tyr Ala Ile Gly Tyr Ser Ser Ile Ser
 500 505 510
 Ala Gly Gly Asn Trp Ile Ile Lys Gly Thr Ala Ser Gly Asn Ser Arg
 515 520 525
 Gly His Phe Gly Ala Ser Ala Ser Val Gly Tyr Gln Trp
 530 535 540

<210> 35
 <211> 461
 <212> PRT
 <213> Neisseria meningitidis

<400> 35

Asn Asn Glu Thr Asp Leu Thr Ser Val Gly Thr Glu Lys Leu Ser Phe
 1 5 10 15

Ser Ala Asn Gly Asn Lys Val Asn Ile Thr Ser Asp Thr Lys Gly Leu
 20 25 30
 Asn Phe Ala Lys Glu Thr Ala Gly Thr Asn Gly Asp Thr Thr Val His
 35 40 45
 Leu Asn Gly Ile Gly Ser Thr Leu Thr Asp Thr Leu Leu Asn Thr Gly
 50 55 60
 Ala Thr Thr Asn Val Thr Asn Asp Asn Val Thr Asp Asp Glu Lys Lys
 65 70 75 80
 Arg Ala Ala Ser Val Lys Asp Val Leu Asn Ala Gly Trp Asn Ile Lys
 85 90 95
 Gly Val Lys Pro Gly Thr Thr Ala Ser Asp Asn Val Asp Phe Val Arg
 100 105 110
 Thr Tyr Asp Thr Val Glu Phe Leu Ser Ala Asp Thr Lys Thr Thr Thr
 115 120 125
 Val Asn Val Glu Ser Lys Asp Asn Gly Lys Lys Thr Glu Val Lys Ile
 130 135 140
 Gly Ala Lys Thr Ser Val Ile Lys Glu Lys Asp Gly Lys Leu Val Thr
 145 150 155 160
 Gly Lys Asp Lys Gly Glu Asn Gly Ser Ser Thr Asp Glu Gly Glu Gly
 165 170 175
 Leu Val Thr Ala Lys Glu Val Ile Asp Ala Val Asn Lys Ala Gly Trp
 180 185 190
 Arg Met Lys Thr Thr Thr Ala Asn Gly Gln Thr Gly Gln Ala Asp Lys
 195 200 205
 Phe Glu Thr Val Thr Ser Gly Thr Asn Val Thr Phe Ala Ser Gly Lys
 210 215 220
 Gly Thr Thr Ala Thr Val Ser Lys Asp Asp Gln Gly Asn Ile Thr Val
 225 230 235 240
 Met Tyr Asp Val Asn Val Gly Asp Ala Leu Asn Val Asn Gln Leu Gln
 245 250 255
 Asn Ser Gly Trp Asn Leu Asp Ser Lys Ala Val Ala Gly Ser Ser Gly
 260 265 270
 Lys Val Ile Ser Gly Asn Val Ser Pro Ser Lys Gly Lys Met Asp Glu
 275 280 285
 Thr Val Asn Ile Asn Ala Gly Asn Asn Ile Glu Ile Thr Arg Asn Gly
 290 295 300
 Lys Asn Ile Asp Ile Ala Thr Ser Met Thr Pro Gln Phe Ser Ser Val
 305 310 315 320

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A2

Ser Leu Gly Ala Gly Ala Asp Ala Pro Thr Leu Ser Val Asp Gly Asp
325 330 335

Ala Leu Asn Val Gly Ser Lys Lys Asp Asn Lys Pro Val Arg Ile Thr
340 345 350

Asn Val Ala Pro Gly Val Lys Glu Gly Asp Val Thr Asn Val Ala Gln
355 360 365

Leu Lys Gly Val Ala Gln Asn Leu Asn Asn Arg Ile Asp Asn Val Asp
370 375 380

Gly Asn Ala Arg Ala Gly Ile Ala Gln Ala Ile Ala Thr Ala Gly Leu
385 390 395 400

Val Gln Ala Tyr Leu Pro Gly Lys Ser Met Met Ala Ile Gly Gly Gly
405 410 415

Thr Tyr Arg Gly Glu Ala Gly Tyr Ala Ile Gly Tyr Ser Ser Ile Ser
420 425 430

Asp Gly Gly Asn Trp Ile Ile Lys Gly Thr Ala Ser Gly Asn Ser Arg
435 440 445

Gly His Phe Gly Ala Ser Ala Ser Val Gly Tyr Gln Trp
450 455 460

<210> 36
<211> 462
<212> PRT
<213> Neisseria meningitidis
<400> 36

Thr Asp Glu Thr Gly Leu Ile Asn Val Glu Thr Glu Lys Leu Ser Phe
1 5 10 15

Gly Ala Asn Gly Lys Lys Val Asn Ile Ile Ser Asp Thr Lys Gly Leu
20 25 30

Asn Phe Ala Lys Glu Thr Ala Gly Thr Asn Gly Asp Thr Thr Val His
35 40 45

Leu Asn Gly Ile Gly Ser Thr Leu Thr Asp Met Leu Leu Asn Thr Gly
50 55 60

Ala Thr Thr Asn Val Thr Asn Asp Asn Val Thr Asp Asp Glu Lys Lys
65 70 75 80

Arg Ala Ala Ser Val Lys Asp Val Leu Asn Ala Gly Trp Asn Ile Lys
85 90 95

Gly Val Lys Pro Gly Thr Thr Ala Ser Asp Asn Val Asp Phe Val Arg
100 105 110

Thr Tyr Asp Thr Val Glu Phe Leu Ser Ala Asp Thr Lys Thr Thr Thr



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115 120 125

Val Asn Val Glu Ser Lys Asp Asn Gly Lys Lys Thr Glu Val Lys Ile
130 135 140

Gly Ala Lys Thr Ser Val Ile Lys Glu Lys Asp Gly Lys Leu Val Thr
145 150 155 160

Gly Lys Gly Lys Gly Glu Asn Gly Ser Ser Thr Asp Glu Gly Glu Gly
165 170 175

Leu Val Thr Ala Lys Glu Val Ile Asp Ala Val Asn Lys Ala Gly Trp
180 185 190

Arg Met Lys Thr Thr Thr Ala Asn Gly Gln Thr Gly Gln Ala Asp Lys
195 200 205

Phe Glu Thr Val Thr Ser Gly Thr Lys Val Thr Phe Ala Ser Gly Asn
210 215 220

Gly Thr Thr Ala Thr Val Ser Lys Asp Asp Gln Gly Asn Ile Thr Val
225 230 235 240

Lys Tyr Asp Val Asn Val Gly Asp Ala Leu Asn Val Asn Gln Leu Gln
245 250 255

Asn Ser Gly Trp Asn Leu Asp Ser Lys Ala Val Ala Gly Ser Ser Gly
260 265 270

Lys Val Ile Ser Gly Asn Val Ser Pro Ser Lys Gly Lys Met Asp Glu
275 280 285

Thr Val Asn Ile Asn Ala Gly Asn Asn Ile Glu Ile Thr Arg Asn Gly
290 295 300

Lys Asn Ile Asp Ile Ala Thr Ser Met Thr Pro Gln Phe Ser Ser Val
305 310 315 320

Ser Leu Gly Ala Gly Ala Asp Ala Pro Thr Leu Ser Val Asp Asp Glu
325 330 335

Gly Ala Leu Asn Val Gly Ser Lys Asp Ala Asn Lys Pro Val Arg Ile
340 345 350

Thr Asn Val Ala Pro Gly Val Lys Glu Gly Asp Val Thr Asn Val Ala
355 360 365

Gln Leu Lys Gly Val Ala Gln Asn Leu Asn Asn Arg Ile Asp Asn Val
370 375 380

Asn Gly Asn Ala Arg Ala Gly Ile Ala Gln Ala Ile Ala Thr Ala Gly
385 390 395 400

Leu Val Gln Ala Tyr Leu Pro Gly Lys Ser Met Met Ala Ile Gly Gly
405 410 415

Gly Thr Tyr Leu Gly Glu Ala Gly Tyr Ala Ile Gly Tyr Ser Ser Ile

420

425

430

Ser Ala Gly Gly Asn Trp Ile Ile Lys Gly Thr Ala Ser Gly Asn Ser
 435 440 445

Arg Gly His Phe Gly Ala Ser Ala Ser Val Gly Tyr Gln Trp
 450 455 460

<210> 37

<211> 356

<212> PRT

<213> Neisseria meningitidis

<400> 37

Asn Asn Val Asp Phe Val Arg Thr Tyr Asp Thr Val Glu Phe Leu Ser
 1 5 10 15

Ala Asp Thr Lys Thr Thr Thr Val Asn Val Glu Ser Lys Asp Asn Gly
 20 25 30

Lys Lys Thr Glu Val Lys Ile Gly Ala Lys Thr Ser Val Ile Lys Glu
 35 40 45

Lys Asp Gly Lys Leu Val Thr Gly Lys Asp Lys Gly Glu Asn Gly Ser
 50 55 60

Ser Thr Asp Glu Gly Glu Gly Leu Val Thr Ala Lys Glu Val Ile Asp
 65 70 75 80

Ala Val Asn Lys Ala Gly Trp Arg Met Lys Thr Thr Thr Ala Asn Gly
 85 90 95

Gln Thr Gly Gln Ala Asp Lys Phe Glu Thr Val Thr Ser Gly Thr Asn
 100 105 110

Val Thr Phe Ala Ser Gly Lys Gly Thr Thr Ala Thr Val Ser Lys Asp
 115 120 125

Asp Gln Gly Asn Ile Thr Val Met Tyr Asp Val Asn Val Gly Asp Ala
 130 135 140

Leu Asn Val Asn Gln Leu Gln Asn Ser Gly Trp Asn Leu Asp Ser Lys
 145 150 155 160

Ala Val Ala Gly Ser Ser Gly Lys Val Ile Ser Gly Asn Val Ser Pro
 165 170 175

Ser Lys Gly Lys Met Asp Glu Thr Val Asn Ile Asn Ala Gly Asn Asn
 180 185 190

Ile Glu Ile Thr Arg Asn Gly Lys Asn Ile Asp Ile Ala Thr Ser Met
 195 200 205

Thr Pro Gln Phe Ser Ser Val Ser Leu Gly Ala Gly Ala Asp Ala Pro
 210 215 220

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 100120 2381760

Thr Leu Ser Val Asp Gly Asp Ala Leu Asn Val Gly Ser Lys Lys Asp
225 230 235 240

Asn Lys Pro Val Arg Ile Thr Asn Val Ala Pro Gly Val Lys Glu Gly
245 250 255

Asp Val Thr Asn Val Ala Gln Leu Lys Gly Val Ala Gln Asn Leu Asn
260 265 270

Asn Arg Ile Asp Asn Val Asp Gly Asn Ala Arg Ala Gly Ile Ala Gln
275 280 285

Ala Ile Ala Thr Ala Gly Leu Val Gln Ala Tyr Leu Pro Gly Lys Ser
290 295 300

Met Met Ala Ile Gly Gly Gly Thr Tyr Arg Gly Glu Ala Gly Tyr Ala
305 310 315 320

Ile Gly Tyr Ser Ser Ile Ser Asp Gly Gly Asn Trp Ile Ile Lys Gly
325 330 335

Thr Ala Ser Gly Asn Ser Arg Gly His Phe Gly Ala Ser Ala Ser Val
340 345 350

Gly Tyr Gln Trp
355

<210> 38

<211> 382

<212> PRT

<213> Neisseria meningitidis

<400> 38

Asn Arg Ala Ala Ser Val Lys Asp Val Leu Asn Ala Gly Trp Asn Ile
1 5 10 15

Lys Gly Val Lys Pro Gly Thr Thr Ala Ser Asp Asn Val Asp Phe Val
20 25 30

Arg Thr Tyr Asp Thr Val Glu Phe Leu Ser Ala Asp Thr Lys Thr Thr
35 40 45

Thr Val Asn Val Glu Ser Lys Asp Asn Gly Lys Lys Thr Glu Val Lys
50 55 60

Ile Gly Ala Lys Thr Ser Val Ile Lys Glu Lys Asp Gly Lys Leu Val
65 70 75 80

Thr Gly Lys Asp Lys Gly Glu Asn Gly Ser Ser Thr Asp Glu Gly Glu
85 90 95

Gly Leu Val Thr Ala Lys Glu Val Ile Asp Ala Val Asn Lys Ala Gly
100 105 110

Trp Arg Met Lys Thr Thr Thr Ala Asn Gly Gln Thr Gly Gln Ala Asp
115 120 125

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Lys Phe Glu Thr Val Thr Ser Gly Thr Asn Val Thr Phe Ala Ser Gly
130 135 140

Lys Gly Thr Thr Ala Thr Val Ser Lys Asp Asp Gln Gly Asn Ile Thr
145 150 155 160

Val Met Tyr Asp Val Asn Val Gly Asp Ala Leu Asn Val Asn Gln Leu
165 170 175

Gln Asn Ser Gly Trp Asn Leu Asp Ser Lys Ala Val Ala Gly Ser Ser
180 185 190

Gly Lys Val Ile Ser Gly Asn Val Ser Pro Ser Lys Gly Lys Met Asp
195 200 205

Glu Thr Val Asn Ile Asn Ala Gly Asn Asn Ile Glu Ile Thr Arg Asn
210 215 220

Gly Lys Asn Ile Asp Ile Ala Thr Ser Met Thr Pro Gln Phe Ser Ser
225 230 235 240

Val Ser Leu Gly Ala Gly Ala Asp Ala Pro Thr Leu Ser Val Asp Gly
245 250 255

Asp Ala Leu Asn Val Gly Ser Lys Lys Asp Asn Lys Pro Val Arg Ile
260 265 270

Thr Asn Val Ala Pro Gly Val Lys Glu Gly Asp Val Thr Asn Val Ala
275 280 285

Gln Leu Lys Gly Val Ala Gln Asn Leu Asn Asn Arg Ile Asp Asn Val
290 295 300

Asp Gly Asn Ala Arg Ala Gly Ile Ala Gln Ala Ile Ala Thr Ala Gly
305 310 315 320

Leu Val Gln Ala Tyr Leu Pro Gly Lys Ser Met Met Ala Ile Gly Gly
325 330 335

Gly Thr Tyr Arg Gly Glu Ala Gly Tyr Ala Ile Gly Tyr Ser Ser Ile
340 345 350

Ser Asp Gly Gly Asn Trp Ile Ile Lys Gly Thr Ala Ser Gly Asn Ser
355 360 365

Arg Gly His Phe Gly Ala Ser Ala Ser Val Gly Tyr Gln Trp
370 375 380

<210> 39

<211> 201

<212> PRT

<213> Neisseria meningitidis

<400> 39

Ser Ala Asn Thr Leu Lys Ala Gly Asp Asn Leu Lys Ile Lys Gln Phe

1 5 10 15

Thr Tyr Ser Leu Lys Lys Asp Leu Thr Asp Leu Thr Ser Val Gly Thr
20 25 30

Glu Lys Leu Ser Phe Ser Ala Asn Gly Asn Lys Val Asn Ile Thr Ser
35 40 45

Asp Thr Lys Gly Leu Asn Phe Ala Lys Glu Thr Ala Gly Thr Asn Gly
50 55 60

Asp Thr Thr Val His Leu Asn Gly Ile Gly Ser Thr Leu Thr Asp Arg
65 70 75 80

Ala Ala Ser Val Lys Asp Val Leu Asn Ala Gly Trp Asn Ile Lys Gly
85 90 95

Val Lys Asn Val Asp Phe Val Arg Thr Tyr Asp Thr Val Glu Phe Leu
100 105 110

Ser Ala Asp Thr Lys Thr Thr Thr Val Asn Val Glu Ser Lys Asp Asn
115 120 125

Gly Lys Lys Thr Glu Val Lys Ile Gly Ala Lys Thr Ser Val Ile Lys
130 135 140

Glu Lys Asp Gly Lys Leu Val Thr Gly Lys Asp Lys Gly Glu Asn Gly
145 150 155 160

Ser Ser Thr Asp Glu Gly Glu Gly Leu Val Thr Ala Lys Glu Val Ile
165 170 175

Asp Ala Val Asn Lys Ala Gly Trp Arg Met Lys Thr Thr Thr Ala Asn
180 185 190

Gly Gln Thr Gly Gln Ala Asp Lys Phe
195 200

<210> 40
<211> 51
<212> DNA
<213> Neisseria meningitidis

<400> 40
caattaacgg ccgaataaaa ggaagccgat atgaacaaaa tataaccgat c

51

<210> 41
<211> 31
<212> DNA
<213> Neisseria meningitidis

<400> 41
tggaatccat ggaatcgcca cccttcctt c

31

<210> 42

<211> 30
 <212> DNA
 <213> Neisseria meningitidis

 <400> 42
 ggtcagatct gtttcattgt tagcacttgc 30

<210> 43
 <211> 30
 <212> DNA
 <213> Neisseria meningitidis

 <400> 43
 gatcaggcct gtatcttcat cggtagcatt 30

<210> 44
 <211> 39
 <212> DNA
 <213> Neisseria meningitidis

 <400> 44
 gacgaaatca acgttccttag cacttgccctg aaccgttgc 39

<210> 45
 <211> 24
 <212> DNA
 <213> Neisseria meningitidis

 <400> 45
 aacgttgatt tcgtccgcac ttac 24

<210> 46
 <211> 39
 <212> DNA
 <213> Neisseria meningitidis

 <400> 46
 aacgcttgcc gcacgcttag cacttgccctg caacgttgc 39

<210> 47
 <211> 24
 <212> DNA
 <213> Neisseria meningitidis

 <400> 47
 cgtgcggcaa gcgttaaaga cgta 24

<210> 48
 <211> 72
 <212> DNA
 <213> Neisseria meningitidis

<400> 48
cagcgagtag gtgaattggt tgattttcag gttgtcgccg gctttgaggg tgtttagcact 60
tgctgaacc gt 72

<210> 49
<211> 24
<212> DNA
<213> Neisseria meningitidis

<400> 49
ttcacctact cgctgaaaaa agac 24

<210> 50
<211> 57
<212> DNA
<213> Neisseria meningitidis

<400> 50
gccagcggtt aatacgtctt taacgcttgc cgcacgatcg gtcaaagtcg aaccaat 57

<210> 51
<211> 57
<212> DNA
<213> Neisseria meningitidis

<400> 51
gtattaaacg ctggctggaa cattaaaggc gttaaaaacg ttgatttcgt ccgcact 57

<210> 52
<211> 11
<212> PRT
<213> Neisseria meningitidis

<220>
<221> misc_feature
<223> "X" is any amino acid or absent amino acid

<400> 52

Xaa Xaa Glu Thr Asp Leu Thr Ser Val Gly Thr
1 5 10